

Pit and Quarry

With which is consolidated
CEMENT-MILL & QUARRY

CHICAGO, SEPTEMBER, 1933

Lime Industry Offers Fair-Competition Code

90% OF INDUSTRY REPRESENTED

Approximately 100 lime manufacturers and interested persons representing allied industries sat in on August 8th with Deputy Administrator Malcolm Muir of the National Recovery Administration who presided at the public hearing held at the Mayflower Hotel in Washington on the Code of Fair Competition for the lime industry, as submitted by the National Lime Association. This Code was presented by Norman G. Hough, president and general manager of the association, who was assisted by representative lime manufacturers from various sections of the United States.

In presenting the code, Mr. Hough stated that he represented over 90 per cent. of the entire lime industry of the United States which was shown to be composed of 309 individuals, firms or corporations who produced and shipped 2,707,614 tons of lime during 1931 (the last year for which complete figures are available). As of May 1, 1933, approximately 6,400 persons were employed directly in the production of lime at an annual pay roll of \$4,275,318.00. Under the code, as revised at the public hearing, approximately 1,800 additional persons will be added to the pay roll at an estimated increase of more than \$1,500,000.00 in annual earnings—all the above in addition to the white-collar workers in the lime industry practically all of whom are now working under President Roosevelt's blanket code.

The lime association code is the first to be presented from the nonmetallic mineral industries and it was brought out in the hearing that intimate relation existed between the lime industry and practically all other basic industries of the nation.

Recognizing sectional differences, the lime code, as revised at the hearing, provides for a minimum wage of 30 c. per hr. for common labor in the South, and 37½ c. per hr. for the same labor in the North instead of 30 and 40 c. as the code was originally drafted. The maximum hours of labor were fixed at 8 hr. in any one day with a maximum of 40 hr. in any one week. The average over a six months' period

must not exceed 40 hr. per week and any overtime over that amount must be at a rate of pay 1½ times the standard. Rates of pay for skilled workers are to be equitably adjusted so as to reflect a proper differential with the rates provided for common labor.

Many Bid on Michigan State Cement Plant

Since the Michigan State Cement Plant at Chelsea, Mich., was offered for sale at public auction on Aug. 15, a number of bids have been received for this plant which cost the taxpayers of the state over a million dollars. The highest bid was that of D. L. Spickler of Detroit who offered \$70,000 for the land and equipment. The Morris Nover Iron Co., Saginaw, offered \$27,500 for the buildings and equipment only.

Reorganize Gibsonburg Lime Products Company

According to newspaper reports received too late to be verified before the publication of this issue the Gibsonburg Lime Products Co., Gibsonburg, O., was recently reorganized and the plant again put into operation. The new officers of the company are: W. H. Price, president; F. W. Zorn, Vice president; W. L. Watt, secretary; Sanford G. Price, treasurer.

New Ohio Agricultural Lime Plant Completed

★ Edward F. Schworm has completed the construction of a new plant at Wilmot, O., for the production of burned agricultural lime. The equipment consists of a continuous draw kiln and screens for sizing the product.

Trap Rock Co. Adds Slag Production Equipment

★ The Trap Rock Co., Minneapolis, Minn., is building a new 3-story addition to its plant near Dresser Junction. This structure will house two new crushers for the production of slag to be used in road building. According to John Wunder, president and general manager of the company, the new federal roadbuilding appropriation will create a considerable demand for this material.

\$70,000,000 to Be Used for Rivers and Harbors

WORK TO PROCEED IMMEDIATELY

The public works administration on Aug. 31 turned over \$70,000,000 to the war department for river and harbor work on 90 projects in all parts of the country. This is in addition to the \$43,000,000 already set aside for flood control and the previous separate allotments of \$11,500,000 for river and harbor work on the upper Mississippi River and the \$14,158,000 for channel work on the Missouri River as far as Sioux City, Ia. Specific allotment of the individual projects will be announced shortly. According to the army engineering department this \$70,000,000 will mean employment for 40,000 men for a year.

Virginia Lime Plant Is Sold and Improved

★ The Virginia Lime Products Co., Inc., Eagle Rock, Va., was recently incorporated with a capitalization of \$40,000 and took over the property of the Moore Lime Co. in that city. A new bag packer, a 1500-ft. cableway from the quarry to the plant and other equipment has been installed and the plant is now in full operation. Officers of the new company are: Maurice D. Langhorne, president; Oscar Laughon, vice president; H. K. Laughon, secretary and treasurer; J. W. Seay, general manager.

Alpha Seven Year Safety Record Ended by Accident

The unprecedented safety record of the Alpha Portland Cement Co. plant at Ironton, O., was brought to an end on July 28 when an employee suffered a fractured skull from a falling piece of limestone. Up to that time the plant had gone 6 years, 7 months and 20 days without a lost-time accident.

★ The John W. Karch Stone Co., Celina, O., recently purchased a new Lima shovel from the Ohio Power Shovel Co., Lima, O.

★ The Cape Girardeau Sand Co., Cape Girardeau, Mo., recently completed improvements to its plant which included the installation of new bins and other equipment.

22nd Safety Congress Program Is Announced

MEETING IN CHICAGO, OCT. 2-6

The detailed program of the Twenty-Second Annual Safety Congress and Exposition of the National Safety Council has just been released. This gathering will be held this year at the Stevens Hotel, Chicago, Ill., October 2-6.

According to W. H. Cameron, managing director of the Council, advance hotel reservations point to the largest attendance of any Congress yet held. The same system of sectional meeting schedules has again been worked out to allow visitors to make the most efficient use of their time while in Chicago. A new feature is the holding of daily subject meetings. The fact that the entire Congress and Exposition are under one roof is another convenience.

J. I. Banash, president of the National Safety Council, will be chairman of the opening meeting on Monday morning, October 2. The all-congress luncheon will be held Tuesday noon with C. L. Rice, president of the Chicago Safety Council, presiding. The banquet and dance will be held Wednesday evening and will be informal. The Rev. Preston Bradley, D.D., will talk on "The Romance of Life" after the banquet and the entertainment and dancing will begin at 9:00 o'clock.

Non-metallic mineral producers will find that many of the subject sessions to be held will be of interest to them, especially those devoted to the dust problem in industry, fire prevention, handling materials, safety equipment, and many others. Meetings of the Cement Section will be held on Tuesday morning and Thursday morning, and of the Quarry Section on Tuesday morning and Wednesday morning. Detailed programs of the Cement and Quarry meetings are given below.

The Exposition, which will take up the entire Exposition Hall of the Stevens Hotel, will be open from 8:30 a. m. to 5:30 p. m. daily. The exhibits will feature displays of handling equipment, head and eye protection, non-sparking tools, first aid and surgical supplies, dust collectors and control systems, electric safety lanterns, foot and leg protection, etc. Attendance prizes will be awarded daily.

Delegates to the Congress will receive special low rates which apply also to visitors to A Century of Progress Exposition. Information on these rates may be obtained from local railroad ticket agents. In certain districts where it is necessary to leave for Chicago on certain dates in order to obtain these rates special reduced fare railroad certificates are available on request which will enable delegates to complete the round trip for 1½ times the regular one-way fare, plus Pullman charges. These certificates may be obtained by writing to Council headquarters.

Town Quarry Denied Right to Sell Stone

NEW YORK COURT DECISION

According to a decision handed down on Aug. 1 by Supreme Court Justice Edward N. Smith the town of Wilna, N. Y., has no right to sell crushed stone from its quarry and crushing plant in competition with private corporations. The action was brought by Jay C. Tooley, a Wilna farmer, against the town board.

The decision holds that the stone produced by the town plant can be used legally only on town highways and that the town cannot compete with private stone concerns in spite of the fact that the quarry and crusher are operated by work relief employees under the Temporary Emergency Relief Administration. The judge maintained that to do otherwise is a waste of public funds in that the town is taking away the business of taxpayers.

New Ohio Gravel Plant Is Under Construction

★ A new company known as the Kinsman Sand & Gravel Co. has begun the construction of a new plant at Kinsman, O., with a capacity of over 50 tons per hr. Equipment including a crane, shovel, screens, washers, pumps, etc., has already been installed and the plant will be in operation shortly. The company is said to be owned by Cleveland interests. William Adrian is superintendent and general manager.

Denver Producer Suffers Severe Loss From Flood

The floods which did thousands of dollars' worth of damage in Denver, Colo., early in August caused damage to the J. W. Brannan Sand & Gravel Co. estimated at between \$50,000 and \$75,000. A 4-story mortar plant owned by the company was twisted from its foundations and washed away together with some of the sand-handling equipment and about 5,000 cu. yd. of sand which was stockpiled nearby. Eight tons of stucco and plaster were also lost.

West Virginia Producer Orders Six Steel Barges

★ The Union Sand & Gravel Co., Huntington, W. Va., has awarded a contract to the McClintic-Marshall Corp. of Pittsburgh, Pa., for six all-steel barges. The barges are of the deck-type, 100 ft. long by 26 ft. wide, and have a capacity of 350 tons each.

★ The Southern Alkali Corp., Corpus Christi, Texas, has purchased a Buffalo 50-ft., 2-section track scale with a capacity of 150 tons per section for its new plant which is now under construction.

Program National Safety Council

Cement Section

Acting General Chairman, DAVID ADAM, Lawrence Portland Cement Co., Northampton, Pa.
Secretary, A. J. R. CURTIS, Portland Cement Assn., Chicago.

TUESDAY, OCTOBER 3

Stevens Hotel, Fourth Floor, Room No. 421A

- 9:45 A. M.—"Our Progress During the Past Year." Acting General Chairman, David Adam.
- 10:15 A. M.—Election of Officers.
- 10:30 A. M.—"Analysis of Accidents in the Cement Industry." A. J. R. Curtis, Asst. to Gen. Mgr., Portland Cement Assn., Chicago.
- 10:45 A. M.—Discussion.
- 11:00 A. M.—"Safeguarding the Health of the Cement Worker." Dr. C. H. Ogden, Surgeon, Illinois Steel Co., Chicago.
- 11:30 A. M.—Discussion.
- 11:40 A. M.—"Safety Kinks." (Illustrated.) A. R. Couchman, Asst. Mgr., Lime Products Dept., North American Cement Corp., Baltimore.

THURSDAY, OCTOBER 5

Stevens Hotel, Fourth Floor, Room No. 421A

- 9:45 A. M.—"What a Safety Program Has Meant to Our Company." Wm. H. Baker, Safety Eng., J. E. Baker Co., York, Pa.
- 10:10 A. M.—Discussion.
- 10:20 A. M.—"Safety and the Man." C. E. Ralston, Safety Dir., Pittsburgh Plate Glass Co., Pittsburgh.
- 10:45 A. M.—Discussion.
- 10:55 A. M.—"Why Safety Pays." J. B. John, Pres., Medusa Portland Cement Co., Cleveland.
- 11:20 A. M.—Round-table Discussion.

Quarry Section

General Chairman, OTHO M. GRAVES, General Crushed Stone Co., Easton, Pa.
Vice-Chairman, S. M. SHALLCROSS, American Lime & Stone Co., Bellefonte, Pa.
Acting Secretary and News Letter Editor, V. P. AHEARN, National Sand and Gravel Assn., Washington, D. C.

TUESDAY, OCTOBER 3

Stevens Hotel, Fourth Floor, Room No. 440A

- 9:45 A. M.—Annual Report. General Chairman, Otho M. Graves.
- 10:00 A. M.—"The Executive's Viewpoint of Safety." (Speaker to be announced.)
- 10:25 A. M.—Discussion.
- 10:35 A. M.—Election of Officers.
- 10:50 A. M.—"How the Insurance Company Looks at Accidents." (Speaker to be announced.)
- 11:15 A. M.—Discussion.
- 11:25 A. M.—Address. (Speaker to be announced.)
- 11:50 A. M.—Discussion.

WEDNESDAY, OCTOBER 4

Stevens Hotel, Fourth Floor, Room No. 440A

- 9:45 A. M.—"The Individual's Responsibility to Safety." (Speaker to be announced.)
- 10:05 A. M.—Discussion.
- 10:15 A. M.—"Emergency First Aid Talk." (Speaker to be announced.)
- 10:45 A. M.—Discussion.
- 11:00 A. M.—"The Mental Effects of Accidents." (Speaker to be announced.)
- 11:30 A. M.—Discussion.
- 11:40 A. M.—Open Forum on Quarry-Section Problems.

National Industrial Recovery

Apportion Funds for National Forest Roads

APPROVE PROJECTS IN 9 STATES

Secretary of Agriculture Henry A. Wallace on Aug. 4 announced the apportionment to states of a total of \$30,000,000 for the construction of roads through national forests and public lands. Fifteen million dollars was apportioned for national forest highways, \$10,000,000 for national forest roads, trails, and related projects and \$5,000,000 for roads through public lands. These amounts were allotted for these purposes by the Federal Emergency Administration of Public Works from \$50,000,000 provided for certain classes of roads in areas subject to Federal control by section 205 of the National Industrial Recovery Act.

The \$15,000,000 for forest highways was apportioned according to the area and estimated value of national forest lands. The \$10,000,000 for forest roads and trails was apportioned according to the need for forest roads and trails in the various forest areas and the possibility of placing such work under construction immediately. The \$5,000,000 for roads through public lands was apportioned among states having more than 5 per cent. of their area in public lands in proportion to the area of public lands in them.

Construction of public lands roads and major forest roads will be supervised by the Bureau of Public Roads. The Forest Service will supervise the construction of minor forest roads and trails. Special regulations relative to the employment of labor and the wages and hours of labor are being prepared and will be enforced.

A National Forest highway construction program including 55 projects in nine states was announced by the United States Forest Service on Aug. 9, to go into effect immediately. The program, prepared by the Forest Service and the Bureau of Public Roads and approved by the Secretary of Agriculture, calls for the expenditure of approximately \$5,000,000 of the \$15,000,000 of National Recovery Act funds apportioned Aug. 2 for National Forest highways.

Projects approved are located in National Forests in Arizona, California, Colorado, Idaho, New Mexico, South Dakota, Utah, Washington, and Wyoming. Location surveys in most of these states are also included in the estimates. Programs for other states containing National Forests, and additional programs for the states already named will be approved as soon as recommendations of the state highway commissions, the Forest Service,

and the Bureau of Public Roads are received.

This program includes the approval of projects in the following states together with the amount approved in each state: Arizona, \$330,000; California, \$746,000; Colorado, \$437,000; Idaho, \$556,000; New Mexico, \$210,000; South Dakota, \$45,000; Utah, \$190,000; Washington, \$820,000; Wyoming, \$286,000.

Estimated Utilization of \$400,000,000 Road Fund

The Bureau of Public Roads has prepared a general construction schedule or progress chart showing the estimated utilization of labor and money under the appropriation of \$400,000,000 for roadbuilding provided by the National Industrial Recovery Act. This chart is based on the assumption that the construction of highways will be pushed as rapidly as possible by the individual states and its preparation was facilitated by the definite understanding between the state highway departments and the federal bureau provided by the programs already approved. It is also expected that the full programs when approved will cause more rapid progress than is anticipated in the chart.

Up to and including August 18, plans, specifications, and estimates have been approved for 465 projects with an estimated cost of \$32,365,455. Contracts had been awarded for 67 road projects. The following list shows the approximate estimated utilization of these funds and of labor by months from August, 1933 to November, 1934.

Month	Men to be Employed	Amount to be Spent
August, 1933	25,000	\$ 4,600,000
September	80,000	12,500,000
October	150,000	23,700,000
November	160,000	25,200,000
December	150,000	23,600,000
January, 1934	135,000	21,500,000
February	133,000	21,000,000
March	153,000	24,000,000
April	180,000	28,400,000
May	211,000	33,200,000
June	228,000	35,700,000
July	232,000	36,500,000
August	236,000	37,200,000
September	205,000	32,200,000
October	148,000	23,200,000
November	77,000	12,000,000

Industrial Sand Producers Join National S. & G. Assn.

The producers of industrial sand have affiliated themselves with the National Sand & Gravel Ass'n. as the Industrial Sand Producers Division and have agreed to abide by the code of the mineral aggregates industries which has been presented at Washington. These producers will, however, set up their own producing regions, marketing areas and committees.

Ready-Mixed Concrete Producers Adopt Code

SIMILAR TO AGGREGATES CODE

The ready-mixed concrete producers held a meeting in Washington, D. C., on August 10 under the auspices of the National Ready-Mixed Concrete Ass'n for the adoption of a code of fair competition. H. F. Thomson, president of the association and vice president of the General Material Co., St. Louis, Mo., presided at this meeting.

The code adopted is in many ways similar to that of the mineral aggregates industries. The rate of hourly pay runs from 45c in the North to 30c in the South. An average of 40 hours per week during the six month period from Mar. 1 to Sept. 1 or from Sept. 1 to Mar. 1 is stipulated with the provision that no employee shall work more than 48 hours in any week or 175 hours in any one month.

Seven administrative regions are set up by the code and the National Administrative Committee is made up of one representative from each region. Provisions are also made for the formation of local organizations in the various marketing areas.

Michigan Producers Form Tri County S. & G. Assn.

The Tri County Sand & Gravel Ass'n was recently formed in Detroit, Mich., by a group of producers operating small roadside pits and plants. The association was originally formed in order that the producers might protect themselves against the independent truckers who buy gravel at low at the pits and then resell it at a profit. Under the present scheme material will be sold only on a delivered price basis. A central purchasing agency has recently been added. C. F. Carey is secretary and manager of the association.

Arkansas Producers Form New Association

The Arkansas Sand, Gravel & Stone Producers Ass'n was recently organized with the intention of expediting the application of the code formulated by the national association among the producers of that state. Officers of the association are: R. S. Wilson, Big Rock Stone & Material Co., Little Rock, Ark., president; C. S. Young, secretary and treasurer.

★ The P. J. Weisel Industrial Sand & Silica Co., Corona, Cal., has recently installed new bins, conveyors and other equipment in its plant near that city.

Contracts Awarded in August Show Increase

PUBLIC WORKS AWARDS LEAD

Contracts awarded in the 37 eastern states for construction of all descriptions during the period from August 1 through August 15, 1933, totaled \$56,243,600, according to the F. W. Dodge Corp. This figure is larger by 30 per cent. than the total for the first half of July but was about 12 per cent. smaller than in the corresponding half of August, 1932. Public works and utilities awards during the first half of August totaled \$27,209,800 and compared with only \$18,940,800 for the entire month of July. It is this class of construction that is looked to, now, to bolster the improvement which has recently been manifested in private construction; hence, the current increase affords considerable encouragement.

South Carolina Plant Buys Large Locomotive

★ The Winnsboro Granite Corp., Rion, S. C., recently purchased an 18-in. by 24-in. Baldwin Mikado-type steam locomotive which has 38-in. driving wheel centers and develops a tractive power of 30,000 lb.

U. S. Gypsum Co. Acquires Asphalt Roofing Company

The United States Gypsum Co., Chicago, Ill., recently acquired the Sifo Products Co., St. Paul, Minn., manufacturers of asphalt shingles, roll roofing, built-up roofing and accessories. This company, which has been in business since 1865, will be operated as a U. S. Gypsum Co. division with the present operating personnel in charge. Several exclusive U. S. G. products will be added to the Sifo line and the company will be an important distribution system in the north central and northwestern states.

New Oregon Lime Plant Now Nearing Completion

★ The Oregon Lime Products Co., which recently started the development of a deposit in the Williams Creek Valley near Grants Pass, Ore., has almost completed the installation of machinery in its new plant which is expected to be in operation early in September. The crushing plant will have an initial capacity of about 100 tons daily and will produce agricultural lime and limestone, poultry grit and similar products.

★ The new plant of the Mississippi Aggregate Co., Jonesville, Miss., was recently put into operation, according to O. J. Towley, manager. The various units of equipment in this plant are driven by separate gasoline engines.

Huron Building New Cement Storage Plant

★ The Huron Portland Cement Co., Detroit, Mich., recently placed a contract with the Burrell Engineering Co., Chicago, Ill., for the construction of a cement storage and bagging plant at Oswego, N. Y. A site 200 ft. by 200 ft. was purchased on the Oswego River several weeks ago. The structure will consist of 6 storage silos 26 ft. in diameter by 90 ft. high with a storage capacity of 75,000 bbl. with their interstices. Cement will be unloaded from boats to the plant through a Fuller-Kinyon pneumatic pumping system and will be recovered from the silos by means of screw conveyors. Shipments from the plant will be made by rail, truck, canal or lake and the plant is expected to be in operation late in November.

Bruns Lime Plant Sold to New Ohio Corporation

The W. H. Bruns Hydrated Lime Co., Woodville O., was sold on July 18 to Attorneys Wolfe and Rogers of Toledo, O., for \$35,000. About 180 acres of land, buildings, machinery, etc., were included in this sale which was made by Frazier Reams, attorney of Toledo, who has been receiver of the plant since 1931. The new owner of the plant was revealed on Aug. 17 as the Washington Building Lime Co., a Maryland corporation, according to advices received from Attorney Reams.

Iowa Stone Plant Is Completely Electrified

★ The Iowa Limestone Co., Alden, Ia., has completed the electrification of its plant near that city which was formerly operated by steam. The space saved by this change is being used for the installation of new machinery for the production of pulverized limestone and chicken grits.

Arkansas Gravel Plant Sold and Will Re-open

The property of the Good Roads Gravel Co., Newark, Ark., was sold recently to A. J. Hughley of Newport. It is said that the company will be reorganized and operations resumed in the near future.

★ The Douds Stone Co., Douds, Ia., recently opened a new pit near Farmington with H. E. Milen as superintendent. Machinery has been installed and production is under way.

★ The C. H. Zigenfuss Co., Allentown, Pa., recently installed a Hendrick Mfg. Co. short-throw shaking screen in its plant in that city.

★ The firm of Dilly and Kemmerer recently installed a new crusher in its gravel plant near Hazelton, Pa.

Talc and Soapstone Association Formed

AGREE UPON COMPETITIVE CODE

The talc and soapstone producers of the United States held a meeting at the Hotel Pennsylvania, New York City, on August 1, 2, and 3. Twenty-five of the total of 32 producers in the country were represented at the meeting which perfected a permanent organization under the name of The National Ass'n of Talc and Soapstone Producers. The following officers were elected to serve until the next annual meeting in June, 1934: President, Michael Doyle, president of the International Pulp Co., New York City; Vice President, E. W. Magnus, vice president of the Eastern Magnesite Talc Co., Burlington, Vt.; Secretary and treasurer, J. B. Aikman, assistant treasurer and manager of the Vermont Talc Co., Chester, Vt.

A board of directors was established consisting of the following, in addition to the president and vice-president of the association: Grant Huntley, president and general manager of the Alberoid Corp. of America, New York City; F. F. Farrar, secretary of the Cohutta Talc Co., Dalton, Ga.; and W. J. Thorn of Innis Spiden & Co., New York and Philadelphia, representing the Pacific Coast Talc Co., the Sierra Talc Co., the Western Talc & Magnesite Co., and the Blue Star Mines, all of Los Angeles, Cal. These directors, including the president and vice-president of the association, were chosen so as to represent the three regions into which the membership was divided. These regions are: New York; New England; Central western and southern states including Pennsylvania and the Pacific Coast states.

Articles of organization and by-laws were adopted. A code of fair competition was agreed upon and a committee appointed to present it to the National Recovery Administration in Washington. This committee consists of the following: Michael Doyle, president; E. W. Magnus, vice-president; J. Frazier Glenn of the Georgia Talc Co., Asheville, N. C.

Buys Iowa Stone Plant and Plans to Improve

The property and equipment of the Marquette Stone Co., located near McGregor, Ia., was recently sold to E. C. Schroeder of that city who has been operating this plant for some time under lease. Indications are that capacity of the plant will be increased and new equipment added.

★ A new producer known as the Caddo Sand & Gravel Co., recently began operation of a new plant at Caddo Gap near Norman, Ark. The deposit is located in an old mill dam and the plant is above the dam.

A Century of Progress



One of six Plymouth locomotives hauling visitors to the Fair from a near parking lot.

Plymouth Locomotives Used on Railway to Fair

In visiting the Century of Progress Exposition in Chicago the first exhibit which comes to the attention of many thousands of visitors is the miniature railway which runs from nearby parking lots to the 12th St. gates of the exposition grounds. This railway was installed solely for the convenience of those using the pay and free parking lots of the South Park Board on Monroe St., and was put into operation late in June.

Six trains are operated on this line which is only $1\frac{1}{2}$ mi. long. Each train consists of an 8-ton Plymouth gasoline locomotive which hauls 7 cars with a capacity of 28 persons each. The locomotives are all painted aluminum and present a pleasing appearance.

International Harvester Has Large Truck Exhibit

One of the features of the Century of Progress Exposition in Chicago is the exhibit of the International Harvester Co. which occupies the entire north wing of the Agricultural Bldg. on Northerly Island. This exhibit, while extensive, does not include the entire line of equipment made by the company but is intended more to show the progress made in the development



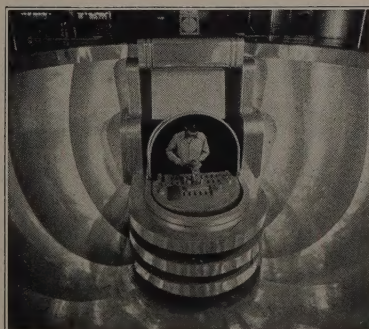
Part of the International truck exhibit.

of machinery, including the tractor and truck.

Seven representative units of the International line of trucks are on exhibition. The one of most interest to pit and quarry operators is the Model A-7 which is equipped with a 10-cu.yd. aluminum dump body and a Heil hoist. Special displays also show how the various important parts of the trucks are constructed. Another display, located in the Travel & Transport Bldg., illustrates the advances made in this type of equipment.

Linde Exhibit Features Welding Demonstration

The exhibit of the Linde Air Products Co. of New York City, at the Century of Progress Exposition is well



Welding with Linde products.

worth seeing. The feature of the exhibit, which is located on the ground floor of the Hall of Science, together with other exhibits of the Union Carbide & Carbon Corp., is a huge sunken metal bowl with concealed lighting, inside which a workman gives actual demonstrations of welding and cutting with an oxy-acetylene outfit. A simple explanation of the process and its

various applications is given. Motion pictures of welding and cutting operations are also shown.

White Co. Features Aluminum Dump Body

The White Co., Cleveland, O., has an exhibit at the Century of Progress Exposition which illustrates the development of motor vehicles. In the Travel & Transport Bldg. is a White steamer which was built in 1900 and has been on exhibition in the Smithsonian Institution for a number of years. Alongside this unit and contrasting with it is a modern White Model 691 SW truck equipped with a Wood hydraulic hoist and an aluminum dump body. Also in this exhibit are a White Model 630 tractor truck equipped with a highway trailer, one of the Studebaker racing cars which finished up well in the last Memorial Day Races at Indianapolis, a cut-away engine and axle, and 100 enlarged pictures of trucks at work in various fields.

The company is also exhibiting in the Great Dome the new White City Coach. This coach is powered with a 12-cyl. horizontally-opposed motor which is mounted with all accessories under the floor of the coach. This arrangement leaves an unobstructed interior for the seating of 44 passengers.



Some of the vehicles shown by White.

Editorial

Problems of Industrial Recovery

THE preparation and submission to the National Recovery Administration of a Code of Fair Competition for the crushed-stone, sand-and-gravel, and slag industries has directed the attention of producers to the points of conflict between the theories of individualism and collectivism on the one hand and between those of retrogression and progression on the other hand. The former type of conflict has been emphasized by the provisions of the National Industrial Recovery Act itself and it occurs, therefore, in every industry which has been or will be brought under the operation of that law. With respect to this conflict the act presents no problems peculiar to the mineral-aggregates industries. But the other type of conflict—that between the spirit which holds back and the spirit which moves forward—occurs or will occur only in those industries which seek to utilize the recovery act as a means for perpetuating the *status quo*. Certain provisions of the mineral-aggregates code have led some observers to declare that the aggregates industries, in so far as their intent can be inferred from the code, have elected to insist on a continuation of things as they are and to oppose not only the introduction of new producing factors but the adoption of improved methods as well.

That section of the code which provides for voting on the basis of the wealth, rather than the number, of producers has been objected to on the ground that it sets up an oligarchic instead of a democratic form of control and, so, contravenes the objectives of the act, one of which is the self-government of industry. With control centralized in the hands of the largest—that is to say, the wealthiest—producers there is no possibility, the objectors say, of meeting the requirement of Sec. 3 of the act, which provides that, in order to be acceptable to the President, a code must not be “designed to promote monopolies or to eliminate or oppress small enterprises” and that it must “not operate to discriminate against them.” Oligarchic government, it is said, is the very antithesis of self-government and therefore could not fail to “oppress small enterprises” and to “discriminate against them.” This near-inevitability is made an absolute certainty, say the critics, by the phrase which provides for the application of the weighted-voting arrangement to the election of the majorities of the Regional and District Committees and of the numerical-voting plan to the election of the minorities of those committees. It is extremely unlikely, the objectors contend, that any minority could ever be represented on either type of committee, and it would be utterly impossible, even if it should be so represented, for it to obtain action in harmony with its views.

It should not be difficult to understand the reasons for which those provisions were placed in

the code. It is but natural that established producers should try to protect their investments in aggregates-producing plants, and it is also only natural that they should estimate the potential danger to their investments offered by competing enterprises in proportion to the size of their investments. Obviously, the commercial risks encountered in operating a large plant are much greater than those surrounding the operation of a small plant, and some plan of disparity in voting power proportional to the disparity in risks would seem to be the proper method in the eyes of large producers. Small enterprises are almost always growing enterprises—at least they are almost always possessed of the potential power to grow—and as such they may cause greater concern to large producers in a competitive sense than enterprises which are already large and, for that reason, nearer the point of their maximum economic development. Competition is usually appraised on the basis of its power to increase, and that power is certainly greatest among those enterprises which have not yet reached their economic maturity. Old age is as greatly alarmed by the advance of youth in economic life as in physical life, and it resorts to the same defensive measures in both.

The same intent which lies back of the adoption of the weighted-voting plan is disclosed by the code's provisions covering the erection of new plants, the enlargement of old plants, and the moving of an existing plant from one producing site to another, in the opinion of most critics of the code. They see in Article V, wherein the prohibition of all these forms of activity appears, an attempt on the part of certain producers to prevent: first, the entrance of newcomers into the field; secondly, any improvement of existing plants which involves an increase in their production capacity; and, lastly, a continuation of the type of production exemplified by the operation of portable plants. These objectives, they assert can not be harmonized with the objectives of the law, which are stated in Sec. 1 of the act to be the removal of “obstructions to the free flow of interstate commerce which tend to diminish the amount thereof,” the elimination of “unfair competitive practices,” and the reduction and relief of unemployment.

THE desire of established producers to perpetuate the *status quo* is a perfectly natural one. With many millions of dollars invested in their present producing facilities, they can not look without concern at the threat of competition coming from new quarters any more easily than they can remain indifferent to the competition of small existing producers. In a field already overcrowded they can see no economic justification for the building of new plants, as long as the potential producing capacity of existing plants is so largely in excess of what the probable demand for aggregates will be

for many years to come. Since Sec. 1 of the recovery act declares it to be the policy of Congress "to rehabilitate industry," they feel that the unrestricted building of new plants will tend to increase rather than diminish the chaos in their industries, will lower the ratio that exists between production and production capacity therein, and so defeat the act's attempts at rehabilitation. They do not wish to see the capital value of their plants decreased by the building of new plants, which, while they represent the investment of additional capital, do not add to the total capital value of their industries.

The attitude of established producers to increasing the producing capacity of existing plants is based, of course, on the same reasoning. If their industries will suffer damage from the building of new plants because of the increase in the excess of producing capacity above market demand that necessarily follows, they must suffer in similar ways from the installation of new equipment in existing plants whenever such improvements result, either inevitably or by design, in similarly increasing those industries' total producing capacity. Consistency demands that they adopt the same stand respecting plant enlargements as they have taken regarding new-plant construction.

TO both these provisions of Article V critics of the code take exception. They allege that the present deplorable state of the aggregates industries is the result of lack of judgment on the part of existing producers, who built new plants and enlarged old ones without regard to the economic necessity for the added production capacity thus provided but with consideration only for the commercial opportunities of the moment, and that the era of unbridled price-cutting which followed was the inevitable result of the senseless overexpansion which they inaugurated. The critics contend that existing producers are seeking, under the cloak of provisions seemingly contrived to further the purposes of the recovery act, to escape the economic penalties which they should properly bear as the price of their misjudgment and their self-seeking individualism. They say further that these provisions, by preventing even those increases in production capacity which follow as incidental gains through the introduction of new machinery, seek to perpetuate the use of the antiquated and inefficient equipment with which most existing plants are fitted and, by that means, not only to defer the time when—due to the lower production costs of more modern and efficient plants—their owners would be compelled to modernize their old plants, but also to justify the higher production costs which their present methods entail and to pass those higher costs on to the consumer in the form of higher prices. The objectors say also that great improvements have been made in processing equipment in recent years, that these improvements are available to the builders of new plants on the advantageous basis of first-installation cost only, whereas operators of existing plants must consider in addition to the first cost of such improvements the depreciated value of the old equipment which those im-

provements would replace, and that for these and other reasons of a like nature established producers are opposed to any alteration of the competitive conditions that prevail.

THE provision which attempts to prevent the moving of "an existing plant from one producing site to another" has awakened strong opposition from several directions. Those who now operate portable plants, either as commercial producers or as contractors making for their own use only, assert that this provision, if accepted, would make the operation of those plants either impossible or commercially unprofitable. The manufacturers of such plants see their investments in plant-manufacturing facilities destroyed by the immediate annihilation of their markets. Government operators of portable plants feel concern over the lack of opportunity to replace or repair their present equipment which would occur if the makers of it should be driven out of business. All these groups object to the definitions in Article I, since these embrace all forms of aggregate production, even that which is not done with the object of sale, and so make the provisions of Article V respecting portable plants almost universally applicable.

In the portable plant the owners of permanent plants see a growing menace. The flexibility of the portable plant, by which it is enabled to follow the job which it supplies, to draw from roadside deposits and thus reduce the need for transportation of both raw and processed materials to very near the minimum, is the quality by which it makes its competition most keenly felt. It is the same quality that makes the motor truck and the motor 'bus such formidable competitors of the railroads, although the quality does not operate in exactly the same way in both cases. Objectors to this provision of Article V point out that the operators of permanent plants have had the same opportunity to participate in the profits and other economic advantages of portable-plant operation as was presented to the railroads when motor transport first demonstrated its superiority, but that, like the railroads, they belittled the economic and competitive importance of the newer utility, and, now that the competition has become formidable and dangerous, again like the railroads, they try to "legislate it out of existence." The objectors take the position that the portable plant, because of its flexibility, is more suited to the problems of modern highway construction (which are concerned so largely with the building of low-cost roads); that it can meet any specifications within the range of a modern permanent plant using like raw materials; that it can produce its material at a much lower cost; and—a point of importance in furthering the aims of the recovery act—it employs, even so, more man-hours of labor per unit of product.

These are some of the weighty questions that must be decided by the National Recovery Administration. Other industries besides our own are waiting to see how significant the administration's decisions may be with regard to the future development of their own industries and of the nation.

A Study of the Hours of Work and the Rates of Pay of Cement Workers*

By H. HERBERT HUGHES
Building Materials Section, U. S. Bureau of Mines

MANY industries attempting to organize under the provisions of the National Industrial Recovery Act have been handicapped by the scarcity of statistics relating to the wages and hours of labor. It is difficult for any group to establish minimum wage rates and maximum hours of labor without the benefit of past experience.

The Portland-cement industry is fortunate in having a reasonably-complete statistical record covering this subject.

Many data collected in past years, however, never have been tabulated in a form to be of use in the preparation of codes of fair practice. For several years those plants especially interested in safety campaigns have reported data on accidents to the Demographical Division of the U. S. Bureau of Mines. This information has been used annually in the compilation of accident statistics, but the tabulation of detailed data on the hours of labor has not been a function of this service. An interpretation of these data in their relation to problems arising in connection with the recovery act is a valuable addition to the information available on employment conditions in the cement industry.

Portion of Industry Included.—The year 1931 is

selected for study because, although unemployment was becoming acute, spread-the-work programs were not yet common enough to complicate statistical records. One hundred and nine cement mills

filed schedules for 1931 operations. These mills represent more than 70 per cent. of the available producing capacity of the industry and accounted for about 75 per cent. of the total production in 1931. A total of 17,876 wage earners

were employed in those plants. They represent nearly 74 per cent. of the total of 24,317 wage earners in the cement industry in 1931 as reported by the U. S. Bureau of the Census. Although the coverage is not complete, it is large enough to be significant.

Wide variation was noted in the returns from the several mills. The number of men employed ranged from less than 50 to more than 400. The 8-hr. shift was the most common, but 7-, 9-, 10-hr. and even longer shifts were reported by several operators. The number of days in operation during the year also fluctuated widely, from less than 100 to the full 365.

Adjustment of Shifts to 8-Hour Basis.—Table I gives a summary of the hours of labor in the cement industry during 1931. To interpret these data properly it may be well to outline the proce-

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Table I—EMPLOYMENT IN THE CEMENT INDUSTRY IN 1931, RECALCULATED IN TERMS OF A 40-HR. AND A 35-HR. WORK WEEK (a)

Number of Days in Operation During the Year in Terms of 8-Hour Shifts <i>b</i>	Equivalents in Hours per Week for 52 Weeks	Number of Men Employed								
		As Reported by Producers			Recalculated with Man-hour Equivalents of All Above 40 Hours per Week Placed in 37-40 Hour Group			Recalculated with Man-hour Equivalents of All Above 35 Hours per Week Placed in 33-36 Hour Group		
		Number	Percentage of Total	Cumulative Percentage	Number	Percentage of Total	Cumulative Percentage	Number	Percentage of Total	Cumulative Percentage
79-104	13-16	130	0.7	0.7	130	0.6	0.6	130	0.5	0.5
105-130	17-20	481	2.7	3.4	481	2.2	2.8	481	1.9	2.4
131-156	21-24	726	4.1	7.5	726	3.3	6.1	726	2.9	5.3
157-182	25-28	231	1.3	8.8	231	1.0	7.1	231	0.9	6.2
183-208	29-32	827	4.6	13.4	827	3.7	10.8	827	3.3	9.5
209-234	33-36	1425	8.0	21.4	1425	6.4	17.2	22406	90.5	100.0
235-260	37-40	1447	8.1	29.5	18358	82.8	100.0			
261-286	41-44	1929	10.8	40.3						
287-312	45-48	1279	7.1	47.4						
313-338	49-52	2253	12.6	60.0						
339-364	53-56	2916	16.3	76.3						
365-390	57-60	96	0.5	76.8						
391-416	61-64	1719	9.6	86.4						
417-442	65-68	1242	7.0	93.4						
443-468	69-72	891	5.0	98.4						
469-494	73-76	122	0.7	99.1						
495-520	77-80	162	0.9	100.0						
Total		17,876	100.0		22,178	100.0		24,801	100.0	
Net gain in employment		(40-hr. week for all plants <i>c</i>) 3,023 or 16.9%			4,302 or 24.1%			6,925 or 38.7%		

a Data from files of the Demographical Division, U. S. Bureau of Mines. *b* Shifts other than 8 hr. have been computed to 8-hr. equivalents. *c* A standard 40-hr. week for all plants would have resulted in a loss in employment of 1,279 men in those plants working less than a 40-hr. week, but a gain of 4,302 men in all other plants, a net gain of 3,023 men.

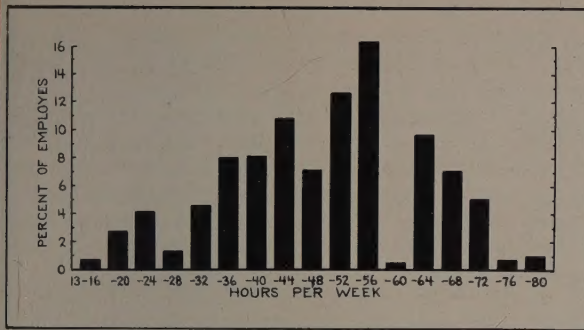


Fig. 1. Allocation of employees in the cement industry by length of work week in 1931.

dure used in making the tabulations. The first step is to calculate 8-hr. equivalents for all mills working shifts other than 8 hr. A mill selected at random from the 109 will suffice as a typical illustration. This plant operated all its departments 330 days in 1931, but the quarry and crusher men worked 10- and 11-hr. shifts respectively, whereas the mill employees worked only an 8-hr. shift. In terms of man-hours, working 10 hr. a day for 330 days is equivalent to 8 hr. a day for 413 days; similarly, 11 hr. a day for 330 days is the same as 8 hr. a day for 453 days. Reduced to 8-hr. equivalents, 6 quarry men worked 413 days, 6 crusher men 453 days, and 120 mill men 330 days. The average number of 8-hr. days worked, calculated by weighting the number of men, amounts to 339 for this mill. The 132 men employed in this plant then, are included in the group shown in column 1 as 339-364.

Carrying the illustration one step further, a plant working 8 hr. a day for 339 days operates for a total of 2,712 hr. during the year. If this time were distributed equally throughout the year, the work-week would amount to 2,712 hr. divided by 52 weeks, or a 52.2-hr. week. Column 2 in the table gives the hours-per-week equivalents of column 1. Strictly, the items in column 2 should be

set up to read "more than 52 and including 56" rather than the contraction "53-56." It should be remembered, therefore, that any work week fractionally higher than multiples of 4 is placed in the next higher bracket; for example, a 52.2-hr. week is included in the 53-56 hr. bracket.

Hours of Work.—The rest of the table shows an allocation of employees by the length of the work week in the several plants. As reported by producers, the work week during 1931 ranged from the 13- to 16-hr. group up to the 77- to 80-hr. group. Plants operating 53 to 56 hr. a week accounted for 16.3 per cent. of the employees. Only two other groups, the 49- to 52-hr. with 12.6 per cent. and the 41- to 44-hr. with 10.8 per cent. of the employees, accounted for more than 10 per cent. each. This distribution of employees by groups is shown graphically in Fig. 1.

Of special significance is the fact that during 1931 only 29.5 per cent. of all employees worked the equivalent of 40 hr. a week or less, whereas the average work week for the entire industry was 47 hr.

Forty-hour Week Increases Employment.—If all the cement plants had operated during 1931 on a standard 40-hr. week, considerable adjustment in employment would have been necessary. Based strictly on the total man-hours of employment, those plants which actually operated at less than 40 hr. a week could have dispensed with the services of 1,279 men if a standard 40-hr. week had been adopted. The other group, however, would have required 4,302 additional men to meet the conditions of a 40-hr. week. This represents a net gain of 16.9 per cent. in the total number of wage earners employed.

It may be more logical to assume that those plants working short hours would have continued to do so. If this situation had prevailed, all plants working more than 40 hr. a week would have re-adjusted their operations for a 40-hr. week, whereas no changes would have occurred in the lower

Table II—EMPLOYMENT IN THE CEMENT INDUSTRY IN 1931 BROKEN DOWN BY KIND OF EMPLOYEES AND RECALCULATED IN TERMS OF A 40-HR. WEEK (a)

Number of Days in Operation During the Year in Terms of 8-Hour Shifts b	Equivalent in Hours per Week for 52 Weeks	Quarry and Crusher Employees						Mill Employees c					
		As Reported by Producers			Recalculated with Man-hour Equivalents of All Above 40 Hours per Week Placed in 37-40 Hour Group			As Reported by Producers			Recalculated with Man-hour Equivalents of All Above 40 Hours per Week Placed in 37-40 Hour Group		
		Number	Percentage of Total	Cumulative Percentage	Number	Percentage of Total	Cumulative Percentage	Number	Percentage of Total	Cumulative Percentage	Number	Percentage of Total	Cumulative Percentage
79-104	13-16	168	4.9	4.9	168	4.4	4.4	60	0.4	0.4	60	0.3	0.3
105-130	17-20	180	5.2	10.1	180	4.7	9.1	282	2.0	2.4	282	1.5	1.8
131-156	21-24	420	12.1	22.2	420	11.1	20.2	342	2.4	4.8	342	1.9	3.7
157-182	25-28	150	4.3	26.5	150	3.9	24.1	525	3.6	8.4	525	2.9	6.6
183-208	29-32	335	9.7	36.2	335	8.8	32.9	617	4.3	12.7	617	3.4	10.0
209-234	33-36	420	12.1	48.3	420	11.1	44.0	693	4.8	17.5	693	3.8	13.8
235-260	37-40	231	6.7	55.0	2,131	56.0	100.0	1,092	7.6	25.1	15,855	86.2	100.0
261-286	41-44	399	11.5	66.5				1,480	10.3	35.4			
287-312	45-48	417	12.0	78.5				960	6.7	42.1			
313-338	49-52	244	7.1	85.6				1,233	8.5	50.6			
339-364	53-56	212	6.1	91.7				2,091	14.5	65.1			
365-390	57-60	192	5.6	97.3				1,562	10.8	75.9			
391-416	61-64	54	1.6	98.9				870	6.0	81.9			
417-442	65-68							544	3.8	85.7			
443-468	69-72	38	1.1	100.0				1,032	7.1	92.8			
469-494	73-76							426	3.0	95.8			
495-520	77-80							607	4.2	100.0			
Total		3,460	100.0		3,804	100.0		14,416	100.0		18,374	100.0	
Net gain in employment					344	or 9.9%					3,958	or 27.5%	

a Data from files of the Demographical Division, U. S. Bureau of Mines. b Shifts other than 8-hr. have been computed to 8-hr. equivalents. c Includes a few employees classed as miscellaneous.

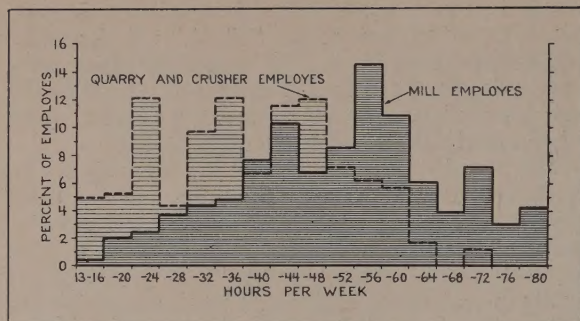


Fig. 2. Allocation of quarry and crusher and mill employees by length of work week in 1931.

brackets. Such an arrangement would have resulted in a net gain of 4,302 men or 24.1 per cent., and 82.8 per cent. of all the wage earners in the industry would have been working 37 to 40 hr. a week with only 17.2 per cent. working 36 hr. or less.

A 35-hr. week has attracted attention since the President's proclamation regarding the "blanket" code. Irrespective of the practicability of applying a 35-hr. week to the cement industry, if the man-hour equivalents of all plants working more than 35 hr. a week are allocated to the 33- to 36-hr. group, a gain of 6,925 men, or 38.7 per cent., would result.

Comparison with 1929.—The Bureau of the Census reported 24,317 wage earners in the cement industry during 1931. If employment gains equivalent to the percentages revealed by this sample are applied to the entire industry, it follows that a 16.9-per cent. increase would have meant the employment of about 28,400 men, 24.1 per cent. about 30,200 men, and 38.7 per cent. about 33,700 men. The census figures for 1929 showed 33,368 men employed in the cement industry. Theoretically, therefore, the adoption of a 35-hr. week during 1931 would have kept employment in the cement industry slightly above the 1929 level.

Comparison of Quarry and Mill Employees.—An indication of the type of employment which might be made available through the adoption of shorter hours in the cement industry is shown in Table II. In 1931 55.0 per cent. of the quarry and crusher employees worked the equivalent of a 40-hr. week or less, whereas only 25.1 per cent. of the mill employees were included in these lower brackets. The average work week for quarry and crusher employees was 37 hr., and for mill employees, 50 hr. The table reveals further that the adoption of the 40-hr. week in 1931 would have resulted in an increase from 3,460 to 3,804, or 9.9 per cent., in the number of quarry and crusher employees, and from 14,416 to 18,374 or 27.5 per cent., in the number of mill employees. The actual allocation of quarry and crusher, and mill employees by the length of the work week is shown in Fig. 2.

Other Influencing Factors.—All the calculations made in this study so far are based on the assumption that productivity in the cement industry is directly proportional to the man-hours of employment, and that the same volume of production would be maintained by the industry when operat-

ing on a 40-hr. or shorter week. Actually, however, productivity may not decrease in direct proportion to a reduction of working hours. Complications of seasonal peaks and the practical application of the shorter week to the problems of continuous operation in the cement industry further confuse attempts to arrive at a logical conclusion regarding the optimum work week. These phases of the problem will be considered in supplementary studies.

Talc and Soapstone in 1932

The total quantity of talc sold by producers in the United States in 1932 was 123,221 short tons, valued at \$1,361,633, according to individual reports furnished by producers to the United States Bureau of Mines. Corresponding figures for 1931 were 163,752 short tons, valued at \$1,852,472. The figures for 1932 comprise 5,635 short tons of crude talc, valued at \$51,657; 107 tons of sawed or manufactured talc, valued at \$17,749, and 117,479 tons of ground talc, valued at \$1,292,227. Soapstone in the United States is practically all obtained by one company at Schuyler, Nelson County, Virginia.

Talc was commercially produced in California, Georgia, Maryland, New Jersey, New York, North Carolina, Pennsylvania, Vermont, and Virginia. Production in Georgia and North Carolina was greatly reduced. Shipments by individual States declined from 4 to 26 per cent. in quantity, and from 5 to 60 per cent. in value; total shipments showed decreases of 25 per cent. in quantity and 26 per cent. in value.

Sand and Gravel in 1932

Preliminary annual figures furnished by the United States Bureau of Mines show that the output of sand and gravel in 1932 reflected the sharp declines in building and highway construction. Total sales of all kinds of sand in 1932 are estimated at 36,250,000 short tons, a decrease of 44 per cent. from 1931, whereas total gravel sales are estimated at 52,750,000 short tons, a drop of only 41 per cent. The total value of sand and gravel sold or used by producers in 1932 declined 46 per cent. from the previous year, from \$86,280,320 in 1931 to \$46,280,000 in 1932.

Use Cellophane Lime Bags

A bag lined with moistureproof Cellophane has been developed by the Rockland & Rockport Lime Corp. of Rockland, Maine, in which lime may be stored for a year or more without taking on moisture. It is believed that, as result of this development, the usual hazard of having the lime heat up or swell and break out of its container is eliminated.

Mineral-Aggregates Code Presented to N. R. A. in Altered Form

Involves Important Changes Affecting the Hours of Labor and Rates of Pay

MORE than 150 persons, representing producers of mineral aggregates and manufacturers of machinery used by them, attended the formal hearing of the *Proposed Code of Fair Competition for the Crushed-Stone, Sand-and-Gravel, and Slag Industries* which was held in the Department of Commerce Auditorium in Washington on August 28 and 29. Deputy Administrator Malcolm Muir of the National Recovery Administration conducted the hearing and was relieved for part of the Tuesday session by Assistant Deputy Administrator Pirnie. The consuming interests were represented by Emil Kekich, economist; the industrial interests by Col. Willard T. Chevalier; the Legal Department of the N.R.A. by Messrs. McNulty and Farnsworth; the Research Department by Mr. Reed; the Labor Advisory Board by John B. Coyne (international representative, International Union of Operating Engineers), Edwin C. Eckel (technical advisor), and Solomon Barkin (specialist on labor economics assigned to this hearing by Dr. Leo Wahlman of the N.R.A.).

Prior to the formal hearing the Committee on Organization of the crushed-stone, sand-and-gravel, and slag industries held open meetings in the Willard Hotel on August 25 and 26. The committee was in session at various times during the nights of those days and on Sunday. Those who objected to various provisions of the proposed ("blue") code

as submitted to the N.R.A. on August 11 were heard, and their suggestions and criticisms were subsequently considered and acted upon by the committee. This resulted in some changes being made in that code and in the presentation at the formal hearing of a revised "proposed" code in mimeographed form.

Four Drafts of Code.—The code which was presented at the formal hearing by Otho M. Graves, chairman of the Committee on Organization and president of the General Crushed Stone Co., differed considerably from the code adopted by the producers in their meetings in Chicago in July. There were the changes made by the committee after the Chicago meeting and following informal discussions with N.R.A. officials and which were incorporated in the second "proposed" draft (the "blue" code); these are shown in italics in the accompanying revisions. There were also the last-minute changes already referred to; these are shown in bold-face type.

There are, therefore, four drafts of the code:

1. The "tentative" (or "white") draft, which was presented to the industries in convention in Chicago, July 13 to 15. This was reprinted in full in the July issue of PIT AND QUARRY, p. 21 to 25 and 50.
2. The first "proposed" (or "yellow") draft, which was adopted at the Chicago meeting. The changes embodied in this draft were printed in full in the August issue of PIT AND QUARRY, p. 28 to 31.



The open committee meeting on August 26, Willard Hotel, Washington. Organization-committee members in foreground (from left to right): Messrs. Love, McKenzie, Potts, Tompkins, Boyd, Graves, Ahearn, Foster, Ireland, Worthen and Rarey.



Formal hearing on mineral-aggregates code, Dept. of Commerce Auditorium, Washington, August 28. N.R.A. officials in foreground behind table (from left to right): Messrs. Eckel, Barkin and Coyne of the Labor Advisory Board, Deputy Administrator Muir, and Col. Chevalier, industrial adviser.

3. The second "proposed" (or "blue") draft, which embodied the changes found necessary after consultation with N. R. A. officials and which was officially submitted to the N. R. A. on August 11. As explained above, these changes are printed in italics in the accompanying revisions.

4. The third "proposed" (or "revised") draft, which was presented at the formal hearing August 28 and 29. As explained above, the changes embodied in this draft are shown in bold-face type in the accompanying revisions.

At the open meetings of the Committee on Organization it soon became evident that opposition to the code would be concentrated on two provisions: (1) the scheme of weighted voting in the election of the regional and district committees, as set up in subsections *e* and *f* of Sec. 6 of Article II, *Organization and Administration*, and (2) the plan for limiting new-plant construction and plant enlargement as set up in Article V, *Plant Capacity and New Production*.

Objections to Weighted Voting.—To the provisions for weighted voting—by which producers are to elect the majorities of their regional and district committees by voting once for each 25,000 tons (or major fraction thereof) of production and sales, respectively, and the minorities by voting once for each producer—objections were made by Richard J. Maloney of Maloney & Doyle, attorneys of Brooklyn, N. Y., on behalf of the Independent Sand & Gravel Corp. of that city. He contended that these provisions would make it impossible for his client to obtain representation on the regional committee of New York State or on the district committee of metropolitan New York. He pointed out also that under the provisions he opposed a majority of the committee might conceivably be the entire committee but one, *i.e.*, 14 of a committee of 15, for example. In view of the latter objection the Committee on Organization decided to amend subdivisions *e* and *f* of Sec. 6 of Article II by inserting the words "by one" after the word "majority" where it occurs. This amendment made a change

in the composition of these committees but not in the method of electing them.

Opposition to Plant Limitations.—Article V was attacked from various quarters. J. E. Pennybacker, general manager of the Asphalt Institute, New York, opposed the article on the grounds: (1) that the mineral-aggregates industries should not attempt to regulate and harass other industries; (2) that the building of low-cost roads requires the use of roadside materials and, therefore, portable plants (the operation of which would be prohibited, he said, by the application of that phrase of Article V which prevents the moving of an existing plant "from one producing site to another"); (3) that the question of determining "wherever commercial production of the products of the industries governed by this code is economically available in adequate quantity" should not be left to permanent-plant operators; (4) that the procedure for obtaining permission to establish a new plant or to increase the production capacity or change the location of an existing plant is so complex as to make it impossible for a portable-plant operator to bid on proposed road jobs; (5) that the provisions of the article are negative in character because they prohibit certain actions by delaying the granting of permission until an investigation can be made; and (6) that the words "promptly and with diligence" do not prevent such a deliberate postponing of action on an application for permission as would destroy the value of a permit even when and if granted.

R. J. Potts, a member of the Committee on Organization and president of the Potts-Moore Gravel Co., reminded the speaker of the right of appeal to the N.R.A., to which Mr. Pennybacker replied that this only added to the delay. E. Guy Sutton, vice-president of the Neal Gravel Co., proposed that "promptly and with diligence" be made 15 days.

As a result the code submitted at the formal hearing contained the words "within 15 days after receipt of such notice" following the phrase "the Regional Committee shall grant permission" and the same words following the phrase "it shall be the duty of the Regional Committee to recommend." These changes were made to meet the last of the objections expressed by Mr. Pennybacker.

Hours and Wages of Labor.—Alex W. Dann, president of the Keystone Sand & Supply Co., suggested that Sec. 2 (Article III) dealing with the hours of labor be amended by inserting the words "dredging and/or" before the word "transportation" in the clause which exempted "crews on floating equipment engaged solely in transportation on navigable waters" from the maximum-hours provisions of the section. His suggestion was accepted and became a part of the code as finally presented.

The question of the hours and rates of pay was discussed at length. E. F. Fitch, vice-president of the Camp Concrete Rock Co., objected to the 30 c. per hr. rate set up in the code for Florida. He contended that the average wage for Negro labor in rural Florida was between 20 and 25 c. an hr. and that the steel and other industries in his section would be damaged if mineral-aggregate producers were required to pay a higher rate. He proposed a

rate of 22 c., which appealed to and was immediately supported by some producers in other southern states where Negro labor is employed. The 22 c. rate was adopted for Alabama, Florida, Georgia, Mississippi and South Carolina and appeared in place of the original 30 c. rate in the code as finally submitted.

In view of the fact that the codes already approved by the President for some other industries provided for higher maxima in the hours of labor, it was deemed advisable to revise the limits set up in Sec. 2 of Article III. The average work week of 36 hr. was therefore lengthened to 40 hr.; the maximum-week provision of 40 hr. was changed to 48 hr. and was enlarged by the addition of the words "nor more than six days in any one week"; the average for clerical workers was raised from 40 to 44 hr. and the maximum from 45 to 48 and to these provisions were added the words "nor more than six days in any one week." All these changes are embodied in the code presented at the formal hearing.

The Formal Hearing.—After the opening of the formal hearing on Monday morning, and following an explanation of the nature of the hearing by a member of the N.R.A. Legal Department, Mr. Graves presented a general statement describing

PROPOSED CODE OF FAIR COMPETITION FOR THE CRUSHED-STONE, SAND-AND-GRAVEL AND SLAG INDUSTRIES

Officially Submitted
to the
National Recovery Administration
on
August 11, 1933
Revised on August 28
for Submission at the Formal Hearing

(The original "tentative" ["white"] draft of the code was reprinted in full in PIT AND QUARRY, July, 1933, p. 21 to 25 and 50. The changes embodied in the first "proposed" ["yellow"] draft were printed in PIT AND QUARRY, August, 1933, p. 28 to 31. The changes embodied in the second "proposed" ["blue"] draft are shown below in italics. The changes embodied in the third "proposed" ["revised"] draft are shown in bold-face type.)

PREAMBLE

[Unchanged.]

ARTICLE I

Definitions

[Unchanged.]

ARTICLE II

Organization and Administration

Sec. 1. [Old word "administration" omitted from both the title and the section.]

Sec. 2. [Title changed to "Districts." Cross reference changed to "Sec. 6(f)."]

Sec. 3. [Title changed to "Committees."]

(a) (Unchanged, except for the third paragraph as indicated in what follows.)

The National Administrative Committee shall make provision for representation of affiliated industries and also afford them opportunity for self-government subject to the provisions of this code.

(b) *National Control Committee.*—The National Control Committee shall consist of fifteen members appointed by the National Administrative Committee, six of whom shall be the ex-officio members of that committee and, in addition

thereto, three members without power to vote, appointed by the National Recovery Administration. Each of the three industries sponsoring this code shall have equal representation on the National Control Committee. The National Control Committee shall refer for hearing and determination, questions exclusively affecting any particular industry or industries to the members of its committee representing said particular industry or industries respectively. Such members shall then act as a sub-committee with power to hear and determine the question in dispute for the entire National Control Committee.

(c) [Unchanged, except cross reference changed to "Sec. 6(e)."]

(d) *District Committees.*—If and when a district is established as authorized by Sec. 2 of this Article, each of the industries actually supplying materials in the district shall elect in the manner prescribed in Sec. 6 (f) of Article II, an odd number of its own members to the district committee, which shall have equal representation thereon for each industry actually supplying materials in that respective district. The district committee shall refer for hearing and determination, questions exclusively affecting any particular industry or industries to those members of its committee elected thereon by the said particular industry or industries respectively. Such members shall then act as a sub-committee with power to hear and determine the question in dispute, subject to the right of appeal as hereinafter set forth.

Sec. 4. (a) [Unchanged, except for the introduction of the following between the old first and second paragraphs.]

If within thirty days after approval by the President of the United States of this code of fair competition, any region or regions herein provided for fail to establish a regional committee or withhold their cooperation in the attainment of the objectives of the National Industrial Recovery Act, then the National Administrative Committee shall appoint, from producers within that region, a regional committee which shall function in the same manner as a regularly elected regional committee.

(b) *Duties of National Control Committee.*—The National Control Committee shall perform such function as may be delegated to it by the National Administrative Committee.

now the code had been formulated. Deputy Administrator Muir then called for protests on the Preamble and the several articles of the code *seriatim*.

The Preamble.—To the Preamble objection was made on behalf of crushed-stone producers by William B. Guitteau, executive secretary of the Ohio Crushed Stone Assn. He protested against the idea of a single code for three industries, claiming that matters affecting crushed-stone producers would be determined by committees the majority of whose members would represent sand-and-gravel and slag producers.

Article I.—The various sections of Article I, *Definitions*, were objected to by N. K. Wilson (representing the Construction Material Producers' Assn. of Wisconsin) and by J. Bruce Cramer (representing the Rock Crusher Manufacturers' Assn.) on the ground that the definitions are too broad. They objected to the elimination from the first ("white") draft of the provisions which excluded the "occasional producer . . . who engages or proposes to engage intermittently in the . . . business for the purpose of supplying materials, either for his own use or otherwise, for a specific construction project."

(c) *Duties of Regional Committees.*—The duties of the Regional Committees shall be to administer the provisions of this code of fair competition in their regions, provided, however, that their actions shall be subject to the review of the National Administrative Committee.

(d) *Duties of District Committees.*—The duties of the District Committees shall be to administer the provisions of this code of fair competition in their districts, provided, however, that their actions shall be subject to the review of their respective regional committees.

Sec. 5. [Unchanged, except for omission of old word "Administrative" from the title "Regional Administrative Committee."]

Sec. 6 (a) and (b). [Unchanged.]

(c) [Unchanged, except as shown for Sec. 5 above.]

(d) *Voting by District Committees.*—The regulations governing the voting of the National Administrative Committee shall apply also to the District Committees.

(e) *Meeting and Voting Within a Region.*—A meeting of producers within a region may be called at the instance of producers representing 25 per cent. of the production within the region, or at the call of either the Regional Committee or the National Administrative Committee. Regional Committees shall consist of an equal number from each industry having actual production in the region, the producers of each industry voting for members who shall represent their industry as follows: a majority by one of the representatives of each industry on the Regional Committee is to be elected by the producers of that industry who shall vote in accordance with their average annual production for five preceding years, each producer to have one vote for each 25,000 tons of production or major fraction thereof, or its equivalent in other units, and the minority members representing each industry shall be elected by the producers of that industry, each of whom shall have one vote irrespective of production. A sanctioning vote shall be considered a majority of the votes cast.

(f) *Meeting and Voting Within a District.*—A meeting within a district may be called at the instance of marketers representing 25 per cent. of the number of companies marketing within the district, or marketers representing 25 per cent. of the sales within the district, or at the call of either the Regional Committee or National Administrative Committee. District Committees shall consist of an equal number

Article II.—Mr. Graves then gave the reasons for the changes made in subdivisions *e* and *f* of Sec. 6, Article II, which have already been explained. He also outlined the reasons for inserting the new Sec. 10, *Supplementary Codes*, as previously suggested by Charles M. Cadman, president of Pacific Coast Aggregates, Inc., to cover those situations where individual states have passed or may pass state industrial-recovery laws. Old Sec. 10 then became new Sec. 11.

Objections to the weighted-voting provisions of subdivisions *e* and *f* of Sec. 9 were voiced by Richard J. Maloney, who had presented the same objections before the Committee on Organization as already mentioned; by James F. Murphy, representing Gallagher Bros. of New York; by William B. Guitteau, representing the Ohio Crushed Stone Assn.; and by Bruce S. Campbell (president of the Harry T. Campbell Sons Co.), representing some Maryland producers.

With reference to Sec. 9, *Statistics*, John J. Moreschi, of the Building Trades Dept. of the American Federation of Labor, pleaded for a provision making the statistics relating to the hours and pay of labor accessible to labor's representatives.

from each industry having actual sales in the district, the marketers of each industry voting for members who shall represent their industry as follows: a majority by one of the representatives of each industry on the District Committee is to be elected by the marketers of that industry who shall vote in accordance with their average annual sales in that district for five preceding years. Each marketer shall have one vote for each 25,000 tons of sales or major fraction thereof in the district, or its equivalent in other units, and the minority members representing each industry shall be elected by the marketers of that industry, each of whom shall have one vote irrespective of sales. A sanctioning vote shall be considered a majority of the votes cast.

Sec. 7. *Right of Appeal.*—Appeal from any decision by a District Committee may be taken to the Regional Committee or Committees of the Region or Regions in which such district is located. Appeal from any decision by a Regional Committee may be taken to the National Administrative Committee, or its accredited representative. The decision of the National Administrative Committee or its accredited representative shall be final except for appeal to the National Recovery Administration. Any producer may exercise the right of appeal as herein provided from any decision affecting the interests of such producer. Questions on original hearing or on appeal exclusively affecting any particular industry shall in every instance be referred for hearing and determination to those members of the Committee elected thereon by said particular industry or industries respectively.

Sec. 8 and 9. [Same as old Sec. 7 and 8.]

Sec. 10. *Statistics.*—All producers governed by this code shall file with the national association of the industry in which they are engaged such records as may be required by the National Administrative Committee with respect to hours of labor, rates of wages, production, stocks on hand, sales and such other information as may be necessary in the accomplishment of the objectives of this code, and such records shall be accompanied by affidavits of the producer certifying as to the accuracy thereof when required by the National Administrative Committee. All records so filed with the national association of the industry and with the National Administrative Committee shall be held as confidential documents, provided, however, that they shall be made available upon request to the National Recovery Administration.

Sec. 11. [Same as old Sec. 9.]

Article III.—In presenting Article III, *Hours of Labor and Rates of Pay*, Mr. Graves gave the reasons for the increases in hours and the decreases in rates, which have already been stated. Speaking for organized labor, Mr. Moreschi demanded a minimum hourly rate of 55 c. in the North and 50 c. in the South, and an average work week of 30 hr. and a maximum of 36 hr.

The plea of southern producers for a minimum rate of 22 c. an hr. was presented by Mr. Fitch and was supported by Messrs. P. W. Parham, R. B. Beatty, T. I. Weston, A. B. Rodes, A. B. Rawn and others. Some of these producers admitted paying Negro laborers as little as 10 c. per hr. in Florida and Georgia and 14 c. an hr. in South Carolina.

Miss Lucy Mason, representing the National Consumers' League, spoke in rebuttal of the southern producers' claim that abrupt increases in the pay of Negro workers would create new sociological problems. She said, speaking as a southern woman, that the South was being seriously handicapped in its struggle for economic betterment by the attitude of those who seek to keep Negro labor and its white-labor competitors on starvation-wage levels and pleaded for a smaller differential between northern and southern rates. As Miss Mason is

the secretary of Secretary of Labor Frances Perkins, her remarks (which were vigorously applauded by northern producers) were construed by many present as reflecting Miss Perkins' views.

Fred Tobin of the Chauffeurs' Union of the American Federation of Labor pleaded for high rates of pay for motor-vehicle drivers.

At the suggestion of the administrator, a committee of producers met a committee of labor representatives Monday night and attempted to arrive at some compromise on the hours and rates of labor. The conference resulted in a deadlock and a report to this effect was made to the administrator on Tuesday.

Former Secretary of State Bainbridge Colby, representing the Crescent Sand & Gravel Co. of New York, argued against the weighted-voting plan as an un-American and undemocratic scheme designed to oppress small producers. He said that the code drafters had alleged in the code that all its oppressive and coercive provisions were in harmony with the spirit of the National Industrial Recovery Act, thus reminding him of British diplomatists who always assert that their dictates and objects are in harmony with the aims of the Creator. By permission of the deputy administrator

ARTICLE III *Hours of Labor and Rates of Pay*

Sec. 1. [Unchanged.]

Sec. 2. *Hours of Labor.*—With the exceptions hereinafter set forth, no employee shall work more than an average of 40 hr. per week for the six months period from February 1 to August 1, or in the six months period from August 1 to February 1; and provided further that no employee shall work more than 48 hr. in any one week, nor more than six days in any one week, but clerical employees and employees engaged in delivery service shall not work more than an average of 44 hr. per week for the six months period from February 1 to August 1, or in the six months period from August 1 to February 1, nor more than 48 hr. in any one week, nor more than six days in any one week. Other exceptions to the maximum number of working hours outlined herein shall include emergency employment occasioned by breakdowns and other factors beyond control, managerial employees, outside salesmen, watchmen, and employees not exceeding 10 per cent. of the total number of employees, required to make it possible for the regular production crew to work its full allotted time; crews on floating equipment engaged solely in dredging and/or transportation on navigable waters, and other classes of employment designated or approved by the National Administrative Committee.

Sec. 3. *Rates of Pay.*—The minimum rates of pay per hour for unskilled labor in the various States, or portions of States, excepting watchmen, water boys, and crews on floating equipment engaged solely in transportation on navigable waters, shall not be less than listed in the following schedule which is made a part of this code.

(a) [Unchanged, except for the following rates which are new.]

Alabama22
Florida22
Georgia22
Mississippi22
South Carolina22

(b) [Unchanged.]

(c) *Wages for Exempted Labor.*—The weekly rate in board or lodging, or money, or both, for watchmen and crews on floating equipment engaged solely in transportation on navigable waters, shall be not less than \$14.00 per week in

the North, \$13.00 per week in the South, and the hourly rate for water boys shall be not less than 50 per cent. of the hourly rates prescribed in sub-section (a) above.

ARTICLE IV *Marketing Practices*

Sec. 1. *Cost Protection.*—Whenever and so long as the National Control Committee determines that it will contribute toward accomplishment of the declared purposes of the code, and whenever the National Control Committee working in conjunction with the various District Committees is satisfied that it is able to determine cost of production, as defined in Sec. 2 of this Article, then the National Control Committee in conjunction with one or more District Committees is authorized to establish in such districts and from time to time revise minimum prices to protect the cost of production of the several products of the industries governed by this code. Such minimum prices shall be established with due regard to the maintenance of free competition between products of the industries governed by this code and with the products of other industries, and to the encouragement of the use of said products of the industries governed by this code.

The current weighted average cost of production of each product of each of the industries governed by this code in a district shall include the various elements of cost as specified in the uniform cost accounting systems as provided for in Sec. 2 of this Article.

No producer selling the products produced by the industries governed by this code in a district in which has been established, as provided herein, a minimum price, shall sell at a less price except to the extent required to absorb the differentials in transportation charges, provided such absorption shall not reduce the net f. o. b. plant price below the prime plant cost as determined under the costing systems provided for in Sec. 2 of this Article.

Sec. 2. *Uniform Cost Accounting.*—The National Administrative Committee shall, with the approval of the National Recovery Administration, establish uniform accounting and costing systems for the industries governed by this code, which uniform systems shall be consistent with reference to basic elements of cost in the industries involved, with such due allowance for individual conditions affecting any producer or group of producers as may be approved by the

he spoke also of Article V, declaring it to have the characteristics of a potential "racket."

Article IV.—Article IV, *Marketing Practices*, as presented by Mr. Graves at the formal hearing, represented a very material alteration of the old article in that it offered a "cost protection" arrangement as a substitute for the "selling below cost," "determination of cost" and "uniform cost accounting" provisions of the third ("blue") draft. These changes were based on the suggestions presented to the committee at one of its night sessions by Messrs. E. G. Sutton, Paul P. Bird, Alex W. Dann, and Charles M. Cadman. After reading the new matter Deputy Administrator Muir asked Mr. Graves if the substitution did not in fact constitute a price-fixing arrangement.

Charles Warner, president of the Warner Co., then offered his open-price plan, which he had presented at the Chicago meeting.

Article V.—Most of the first afternoon's session and a large part of Tuesday's discussions were devoted to Article V, *Plant Capacity and New Production*. Despite the opposition to this article already voiced in the committee's open meetings, the committee deemed it wise to let the article stand, except for the changes already noted. This

decision was fortified by the knowledge that some codes already approved—notably the steel and the lumber codes—embody similar checks on overexpansion.

Most of the opposition directed at this article came from the operators and manufacturers of portable plants, who felt that their businesses would face annihilation if the article, with its provision prohibiting the removal of "an existing plant from one producing site to another," were allowed to stand. N. K. Wilson, who had spoken before the committee on this subject, restated his objections and cited figures to show that portable plants employ more labor per unit of output than do permanent plants. He said that the average portable plant was capable of producing only about 3 tons per man-hr., whereas permanent plants could produce as much as 40 tons per man-hr. He said that, for this reason, portable plants were aiding the President's plan for increasing employment and that extermination of the portable plant would decrease employment. A. M. Bloomer, a Wisconsin contractor and portable-plant operator, supported Mr. Wilson's argument. The same position was taken by Messrs. Heyward Green (of the Green

(Continued on page 40)

National Administrative Committee in conjunction with the National Recovery Administration, including in this respect any district so electing, the addition of transportation changes as a cost element, which cost shall also include as an element of cost a reasonable return on capital invested.

Each producer shall adhere to the uniform system adopted for the industry in which he is engaged to the extent of incorporating in all calculations of cost all of the elements outlined in the standard cost accounting system.

Prime plant cost referred to in Sec. 1 of this Article shall include all cost elements included in the costing system except return on capital invested, interest on borrowed capital, depreciation, depletion, taxes, administration and selling.

[Old Sec. 2. (Sec. 3 in "blue" draft) omitted. Subject matter covered by new Sec. 2 above.]

Sec. 3. Uniform Terms of Sale.—In each region or district the Regional Committee or District Committee may establish uniform terms of sale uniform within such region or district which shall be binding upon all producers selling in that region or district.

[This supplants old Sec. 3 (Sec. 4 in "blue" draft).]

Sec. 4. Uniform Credit Practices.—In each region or district the Regional Committee or District Committee may establish credit practices uniform within such region or district which shall be binding upon all producers selling in that region or district.

[This supplants old Sec. 4 (Sec. 5 in "blue" draft).]

ARTICLE V

Plant Capacity and New Production

Sec. 1. *To promote the fullest possible utilization of the present productive capacity of the industries governed by this code and to effectuate the other purposes of the National Industrial Recovery Act, before a new plant may be established or the producing capacity of an existing plant increased, or an existing plant be moved from one producing site to another, notice of such intent must be given to the Regional Committee of the region in which the new production capacities are proposed to be located. Upon receipt of such notice, the Regional Committee shall collect promptly and with diligence complete information concerning the existing production capacity in that area. If these data disclose that such new production capacity will not tend to defeat the purposes of the National Industrial Recovery Act,*

as herein set forth, then the Regional Committee shall grant permission within fifteen days after receipt of such notice for the proposed increase in production capacity in that area. If, however, these data disclose that wherever commercial production of the products of the industries governed by this code is economically available in adequate quantity and such proposed increase in production capacity does tend to defeat the purposes of the National Industrial Recovery Act, as herein set forth, then it shall be the duty of the Regional Committee to recommend, within fifteen days after receipt of such notice, to the National Control Committee that permission to increase the production capacity in that area be denied. The decision of the National Control Committee shall be subject to appeal only to the National Recovery Administration.

The provisions of this section shall not be construed as preventing a producer from improving the efficiency of his plant through the installation of new machinery, or adopting such methods as will lower production costs.

ARTICLE VI

Unfair Competitive Practices

Sec. 1 to 8. [Unchanged.]

Sec. 9. Anti Dumping.—Any producer governed by this code shipping his product into regions or districts outside of his natural market area shall not sell such material below the general market price prevailing in the region or district into which shipments are made.

[Old Sec. 14 omitted.]

Sec. 10 to 13. [Unchanged.]

Sec. 14. [Same as old Sec. 15.]

ARTICLE VII

Changes in the Code

[Unchanged.]

APPENDIX I

Regions 1 to 6. [Unchanged.]

Region 7. [Old words "(including that portion of the Ohio River south of the State of Ohio)" omitted.]

[Numerous editorial changes have been made elsewhere in the code. Thus, throughout the code in general, where reference was formerly made to "crushed-stone, sand-and-gravel, and slag" producers or industries, the language has been changed to include all producers and industries governed by the code.]

Gravel Plant in Iowa Installs Additional Facilities for Washing Product

Soft Stone and Shale Removed by Disintegrator and Spray Nozzles

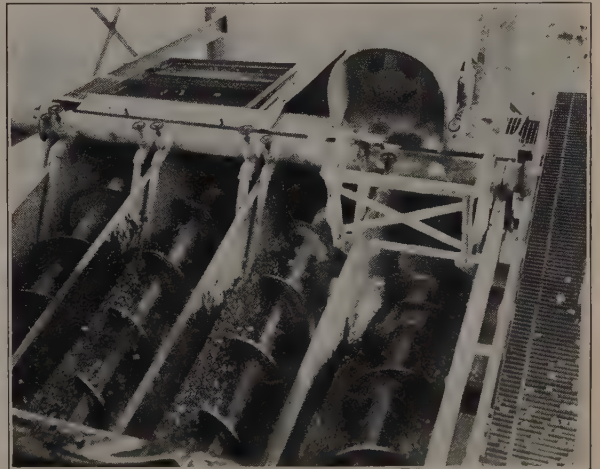
THE sand-and-gravel plant operated by L. G. Everist, Inc., at Hawarden, Ia., was considered one of the outstanding plants in that section when it was built six years ago. Since that time changes have been made which have kept this operation modern and efficient in every respect. A complete description of this plant as originally built was published in the July 4, 1928, issue of PIT AND QUARRY. The most important change made was the installation of additional facilities for thoroughly cleaning the gravel by removing the shale and iron oxide which occur in the deposit.

The material is removed from the deposit by a Monighan drag-line operating a 3-cu.yd. Page bucket. This was originally a 2-cu.yd. Diesel-engine unit but a 250-hp. Westinghouse electric motor was installed in 1931 and the larger bucket substituted. The material is hauled by locomotive and cars to the plant, where it is discharged through a 7-in. grizzly into a 100-ton track-hopper. A pan feeder discharges the material to an inclined belt-conveyor leading to the scalping-and-crushing building. An Allis-Chalmers 60-in. by 12-ft. revolving screen scalps the material over 2½-in. in size and discharges it to an Allis-Chalmers No. 5 Gates gyratory crusher. A bucket-elevator feeds back to the screen. A second inclined belt-conveyor feeds a sluice-box at the top of the washing-and-screening building. Here the washing process is begun by an 8-in. stream of water.

The material passes from the sluice-box to a 60-in. by 18-ft. revolving screen which has an 8-ft. scrubber section, the remaining portion having 1½-in. perforations. Sprays in this screen do additional

washing. A 13-ft. sand-jacket on this screen has ⅜-in. by ¾-in. slotted perforations which remove the sand. Part of the sand falls on an inclined plate having ⅜-in. round perforations. The sand passing through this plate is flumed to a Tel-smith No. 6 settling-tank which produces plaster sand. The remainder of the sand goes through another flume to a second Tel-smith No. 6 settling-tank which produces concrete sand. Both tanks discharge directly to bins and the overflow from them is flumed to a waste-pond. A third cone is still in place although it is no longer being used.

The gravel over ¾ in. in size drops from the revolving screen into a disintegrator or breaker which is of the company's own make and was installed in 1932. This consists of a 3-ft.-diameter revolving table which has 4 blades and is driven at a fairly high speed. Soft stone and shale and pieces of oxide of iron when struck by these blades are broken



One of the 2 banks of four 12-in.-diameter single-screw deshalers which give the gravel a final washing.

up and dissolved by the water. This table discharges to a double-deck 3-ft. by 6-ft. gyrating screen where the material passes under 16 Binks spray nozzles. This screen has ½-in. and ⅜-in. Tyler spring-steel wire cloth and divides the material into two sizes and waste.

Each of these two sizes of gravel goes to a separate bank of four Stephens-Adamson 12-in. diameter single-screw deshalers which give the gravel a final washing. These, also, were installed in 1932. The waste from the screen and the screws is also flumed to the waste-pond. Both the disintegrator and the gyrating screen are belt-driven from a countershaft by the same motor that drives the re-



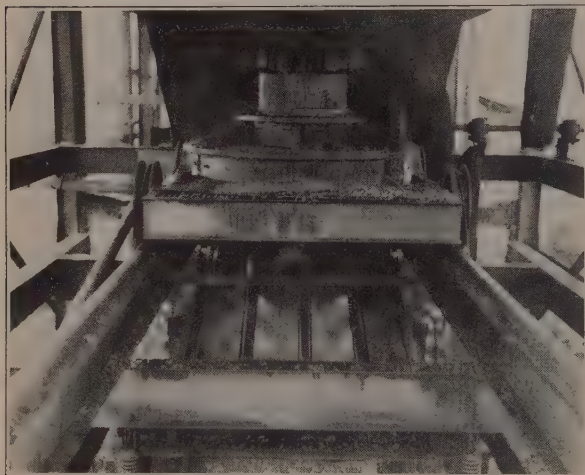
The screening-and-storage building with main conveyor at left and waste flume in foreground.

volving screen. Each of the two banks of screws is Texrope-driven by a 10-hp. General Electric motor.

The deshalers used for $\frac{1}{2}$ -in. to $1\frac{1}{2}$ -in. gravel discharge directly into the paving-gravel bin. The deshalers for the $\frac{3}{16}$ -in. to $\frac{1}{2}$ -in. gravel discharge through a chute which has a gate so arranged that the material can go to the bin for this size of material, to a pit-run gravel bin, or in any desired proportion to a 24-in. by 12-ft. belt-conveyor which feeds the paving-gravel bin. Another gate, below the first one in this chute, allows some of the material going to the belt-conveyor to be diverted to a mixing screw which discharges it direct to cars on an



The double-deck 3-ft. by 6-ft. gyrating screen which is equipped with 16 spray nozzles to give the gravel a thorough washing.

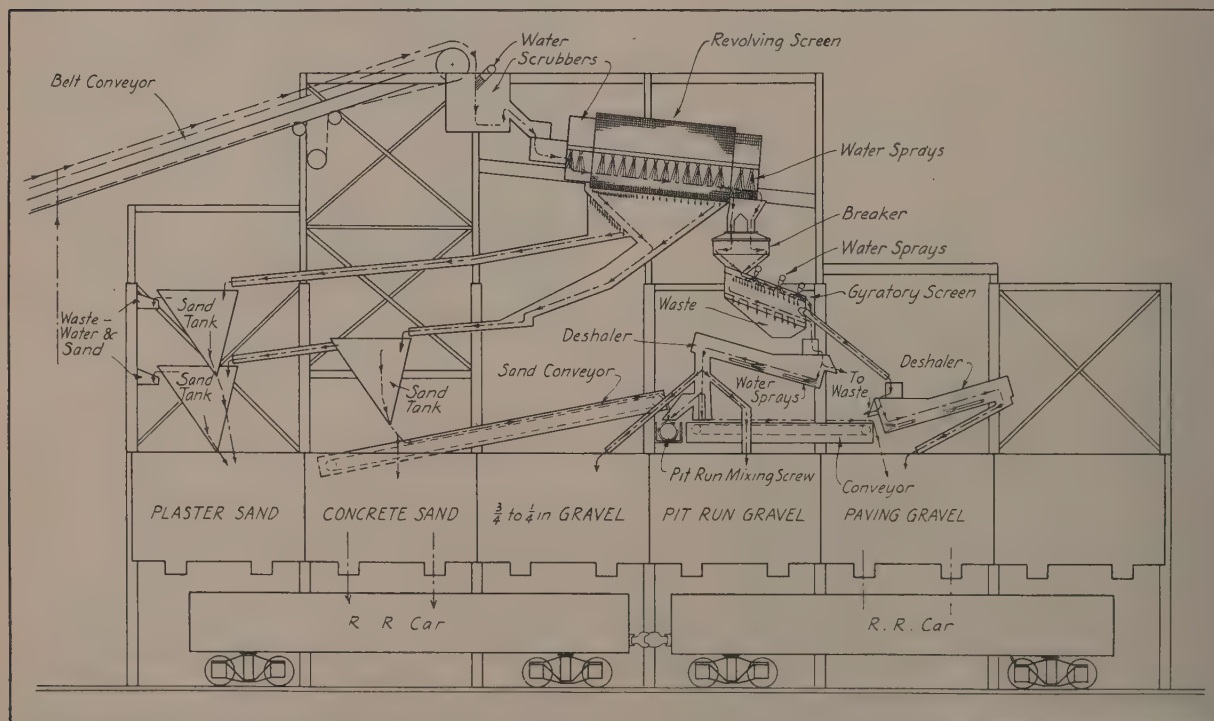


The 3-ft.-diameter revolving disintegrator which breaks up shale and soft stone before discharging to vibrating screen below.

a siding alongside the plant. Another 24-in. belt-conveyor operating on 24-ft. centers can feed the concrete-sand cone discharge to the same mixing screw where any desired amount of gravel may be added. Each of these two conveyors and the mixing screw is driven through a Jones speed-reducer. There are six parabolic steel bins with a capacity of 60 tons each. Only five of these are being used at present and they discharge through clam-shell gates to cars on a track below them.

Originally the waste material and water from this plant were flumed direct to a waste-pond but this was soon filled up. In 1929 a concrete sump

(Continued on page 38.)



An elevation drawing of the screening-and-storage building which illustrates the arrangement of the equipment and the flow of the material through the plant.

Problems Encountered in Application of Filters for Cement Slurry

Equipment Raises Production $16\frac{2}{3}$ Per Cent., Lowers Fuel Cost $12\frac{1}{5}$ Per Cent.

By C. H. SONNTAG

Plant Manager, Lawrence Portland Cement Co.

THE filter installation in the plant of the Lawrence Portland Cement Co. at Thomaston, Me., has now been in use over two and one-half years. During this time the few difficulties that were encountered have been smoothed out, and the records of operation cover a period long enough to warrant considering them representative of what may be expected in the future. For this reason it is thought that the story of these filters and the equipment immediately associated with them might be interesting to others in the cement industry.

Raw Materials.—When the mill was first started early in 1928, the raw materials used consisted of a fairly high grade of limestone and clay. After about a year the quarry worked into a deposit of low-lime stone, so that less and less clay was required and at the time the filters were put in the plant was being run on a mixture of high and low-lime stone without clay. This condition has continued to the present. Grinding is done to a fineness of 10 per cent. retained on a 200-mesh sieve, calculated on the dry solids, when the slurry is washed through the sieve with a spray of water.

Burning.—There are two kilns, 11 ft. in diameter inside the shell and 200 ft. long. They have a slope of $\frac{3}{8}$ in. per ft., and are driven by slip-ring motors at a maximum speed of 1 rev. in 1 min. 29 sec., and a slow speed of 1 rev. in 3 min. 15 sec., with nine points of control between those limits. The brick-retaining circles at the feed ends have an opening 78 in. in diameter, but this opening is somewhat restricted by the feed pipe. Each kiln has a stack 11 ft. in inside diameter and 200 ft. high above the gas entrance.

We hope to speed up one of our kilns to 1 rev. in 1 min. on high speed, in order to learn whether such a change will materially affect production or fuel economy.

Pulverized Fairmont (W. Va.) coal is burned. It is fed to each kiln by a Bailey feeder which is calibrated often enough so that its rate of feeding is known, although the weight of the coal used is also checked before it enters the coal-preparation department. Each Bailey feeder is driven by an adjustable speed d.-c. motor. Each kiln is set directly over a 10-ft. by 90-ft. rotary cooler, the hot air from which passes directly up into the kiln, so that much of the air required for combustion is highly heated.

Filters.—The filters are of the American disk type, 8 ft. 6 in. in diameter, with 100 sq.ft. of filter-

ing surface per disk. They are arranged in units of seven disks each, and there are two units or 14 disks for each kiln (Fig. 1). Preliminary tests, made before the machines were bought, indicated that 1,000 sq.ft. of filtering surface per kiln would be enough, but in view of the possibility that clay might be used again at some future time, it was felt that the provision of 1,400 sq.ft. per kiln would be safer. Although clay has not yet been used, the wisdom of this decision has been amply proved. If a filter should prove to be so much too large that the entire surface is never needed, the situation is easily remedied by removing all the sectors in one or more disks and plugging the holes in the drum shaft, but if a filter is too small, there is little or nothing that can be done about it.

Each unit of seven disks is driven by an adjustable-speed d.-c. motor having 11 points of speed control. They are started and stopped by push-buttons (Fig. 1), but the control is so arranged that after a stop they will, when again started, come up to the speed at which they were running before the stop, provided that the setting of the speed control has not been changed. The cake from each group of two filters falls on a belt-conveyor that carries it to the water-jacketed feed hopper and screw. Merco-Nordstrom valves were used in all the slurry piping.

Control of Feed.—Before the filters were purchased each kiln was supplied with slurry by a Ferris-wheel feeder which was driven from the kiln gear train by a wire-rope transmission, so that a definite amount of slurry was fed into a kiln for each revolution regardless of its speed. It was felt that this feature of proportionality of feed to speed should be retained, so when the filter installation was designed, it was arranged that the filters should be fed by the same Ferris wheels that were part of the original lay-out. They were moved to higher elevations, on platforms in the roof, so as to feed the filters by gravity. The overflow from the feeders goes back into the main slurry-storage basin in the kiln room. The same is true of the overflow from the filters, if there is any, but this is discussed in a later paragraph.

Fortunately the Wilfey pumps that supplied the Ferris-wheel feeders were able to send slurry to them in their new location without speeding up or changing motors. The feeders are still driven by wire rope from the kiln gear train. It is believed that this is the first installation in which filters are supplied with slurry by means of Ferris-wheel



Fig. 1. The slurry filters running. Note the electrical controls in the center background.

feeders, although we understand it is now considered standard practice.

Counters on the feeders, with a knowledge of the number of buckets on each wheel, give the basis for calculating the day's production of each kiln. The piping and valves are so arranged that, if necessary, the filters may be by-passed and wet slurry may be fed by either Ferris wheel direct to the corresponding kiln.

Slurry-Level Control.—In earlier installations slurry was fed direct to the filter tank, which was allowed to overflow without much restraint. With this method of operation there could, of course, be no way of gaging the needs of the kiln nor of telling the amount of slurry burned except by measuring the tanks. There was no means at all of learning the volume of slurry fed to individual kilns or of maintaining a fixed ratio of feed rate to kiln speed.

It was felt that if the principle of "feed proportional to kiln speed" were to be retained after the filters were put in, the Ferris-wheel feeders were not in themselves sufficient. It appeared that all the slurry measured by the feeders and passed by them to the filters should actually be filtered and fed to the kilns. This meant that the filters should not be allowed to overflow and so return to the storage basin slurry that had been measured by the Ferris wheels. For a time this situation was met by instructions to the operators to vary the speed of the filters manually in accordance with the height of the slurry in the tank; in other words, if the tank were filling up and likely to overflow, they were to speed up the filter, and if the slurry level were going down, they were to slow the machine down also, but in no event to allow overflow.

This method was reasonably good, but its weakness was the human element. It seemed impossible

always to anticipate the demand of the kiln, and overflows were not uncommon. Manifestly, when an overflow occurred, the day's production as calculated from the record of the Ferris wheel was greater than the actual output. It was felt that an automatic control of the filter speed in accordance with the slurry level would be worth while, if it could be done. In working this out our electrical engineer, J. M. Pomeroy, designed a control consisting essentially of a conical flat-bottomed float from whose apex rises a guided rod carrying a carbon brush which moves over stationary contacts in such a way as to cut resistance into or out of the shunt-field circuit of the motor driving the filter under control (Fig. 2), and so speeding it up or slowing it down in accordance with the rise or fall of the slurry in the tank. The device works perfectly, and overflow is entirely prevented as long as the filter cloths are in good condition. The float is made conical so as to minimize the building up of half-dried slurry on it. There are eight points in this control.

The filter speeds up when the level of the slurry in it rises. This comes about when the Ferris-wheel feeder sends more slurry to the filter, which happens when it speeds up because the kiln that drives it speeds up. There is thus a time lag of a minute or two between the speeding up of the kiln and that of the filter, and, in like manner, when the kiln is slowed down, and the claim may seem justified that the kiln does not always get a fixed amount of feed per revolution, or, what amounts to the same thing, that the feed is not uniform. The range of rise and fall of the slurry in the filter tank is $6\frac{1}{2}$ in. The area of slurry surface in the two filter tanks supplying one kiln is 121.5 sq.ft. If the lag involved this whole volume it would come to only 65.9 cu.ft., equivalent to 7 bbl. Actually, the control begins to act on a change in level of 2 in.,

so that only a small part of this volume really constitutes lag, and the burners are not able to see any irregularity in the supply of raw material coming into the clinkering zone because of the action of this control.

Since overflow is prevented, the records taken from the Ferris-wheel counters, when calibrated by comparison with the production for several months as ascertained in other ways, give a very accurate tally of the output of each kiln for each day.

Slurry Cake.—A slurry containing much clay or shale is likely to be quite colloidal in nature, and filter cake made from it is likely to be impervious to water, hard to build up into a thick cake, and difficult to dry. It will be sticky and not easily stripped from the filter cloth.

Since the Thomaston slurry contains no clay, it possesses what is commonly called "shortness." Water is withdrawn from it easily, and it cracks soon after leaving the bath. It is probable that this early cracking allows air to enter the system and lower the vacuum, but in experiments, in which the cracks were closed manually as soon as they formed, the cake was only a few tenths of 1 per cent. drier as determined by laboratory test, so that the ill effect of early cracking is not as great as one would think when first observing it.

The cake is stripped by slightly inflating the bags with low-pressure air, much of it falling off as the bag is inflated. The rest is removed by scrapers between which the disks pass (Fig. 3). Corrugated rolls for compressing, cracking and stripping the cake are not used.

Lifters in the Kilns.—As the feed to the kilns from the filters is a plastic cake rather than a fluid slurry, it was feared that it might stick together and form large "logs" in the feed ends of the kilns, and might even spill over into the dust chambers. It was believed that means should be adopted to insure that the cake would be carried some distance into the kilns. The plan chosen was the installation of cast-iron lifters projecting 12 in. above the brick linings, and set spirally in the upper 20 ft. of the kilns so as to carry the feed forward as the kilns revolved.

In actual operation the spaces between the lifters began to fill with dry feed after a few days' run. They filled completely to a level with their tops during a few hours when it was necessary to feed wet slurry, and much of the raw material spilled over into the



Fig. 3. The filter cake cracks early and is easily stripped.

dust chamber. We were forced to shut the kiln down and go in and break out this accumulation with picks, as it proved to be quite hard. At the same time we broke out every other lifter so as to leave spaces between them, and since then no filling has occurred.

This experience was had with the first kiln to which filters were applied. In preparing the second one we set the lifters with spaces between them. In the two years that have passed the heat has so warped and weakened the metal of which the lifters were made that most of them have broken off. They will not be replaced, for they are expensive to set among the brick and no advantage from their use was apparent. There has never been any tendency to form a "log," and since the lifters are gone wet slurry may be fed at any time without trouble, though it has been done only three or four times.

Feeding the Cake.—The cake is fed into the kiln by a device that is essentially an inclined screw-conveyor running in a water-jacketed hopper and pipe. The screw runs at about 110 r.p.m. This seems rather fast, but the thought is that a piece of filter cake falling into the screw will be at once thrown out to the periphery, where it will be more easily carried forward. The idea is sound, for the screws have never choked. Then, too, at times the feed is quite heavy, and well up to the capacity of the screw considered as a conveyor.

Earlier feeders of this type had a pair of bevel or miter gears at the upper end of the screw, and the drive was rather bulky and the gears were exposed. It was thought that a standard worm-gear speed-reducer could be adapted to this work, and to this end the manufacturer of the reducer designed a special base so that the inclined screw could be driven directly from the reducer through a flexible coupling (Fig. 4). The likelihood of misalignment made the use of the belt-and-pin type of coupling desirable, as it will continue in operation under quite unfavorable conditions. The inclined speed-reducers and all others were made by the Philadelphia Gear Works.

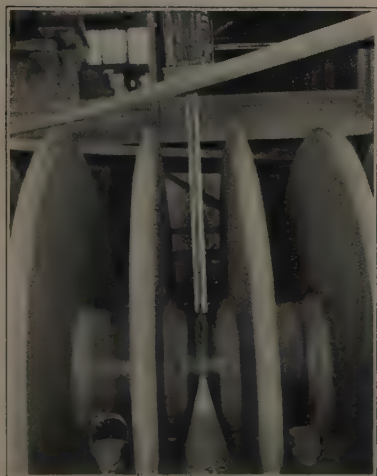


Fig. 2. The slurry-level float control.



Fig. 4. The feeder floor, showing (foreground) the filter provided with a pug-mill (below the bin).

In this design of feeder there is a considerable weight of screw-conveyor overhung below the lower bearing, as there is no bearing below the place where the cake drops into the screw. This is not very good engineering, but is about the best that can be done under the circumstances. We are experimenting with a new design having three bearings, but have not brought it beyond the development stage.

The feed screw turns inside a pipe that is supposed to be removable, as a unit with its contained screw, from the water-jacketed hopper. We have never been able to move this pipe, as it soon became packed in with dried slurry, and we have learned to pull out the screw, leaving the pipe in place. The latter carries the bearings and protects the water-jacket from cutting by the screw.

There is a considerable flat area in the vertical walls of the hopper part of the water-jacket, and it is subject to whatever water pressure may be present. These flat surfaces bulged after a while, and we were forced to insert stay-bolts such as are used in the water-legs of locomotive-type boilers.

There has been no deposit of scale in the water spaces, but rather there is some evidence of corrosion and pitting. This is because the water we purchase has nearly a zero-degree hardness.

Control of Jacket Water.—Since we purchase our water, it is desirable to use as little as possible. In the present instance it means that the water discharged from the water-jackets must be as hot as it can be and still not be boiling. For a time we depended on manual adjustment for this, but too much attention was needed and the results were not very satisfactory. To better the situation we placed on each jacket a Sarco thermostatic regulator with its bulb immersed in the discharge water, but the controlled valve in the inlet pipe. The regulator is set at 180 deg. F. (82 deg. C.) and takes care of the jacket-water very nicely through the wide range of flow that is essential to the economical use of water.

Since this installation was made three other types of filter-cake feeders have come into use:

(1) A plain inclined pipe, made of high-temperature alloy, with a hopper at the upper end. The sudden evolution of steam when the cake strikes the hot pipe is depended upon to prevent sticking and clogging.

(2) The same high-temperature hopper and pipe with the addition of an inclined screw, such as has been described. This would seem to prevent any possibility of clogging.

(3) The Kronstadt or shell-type feeder. In this the cake enters the kiln through spiral slots around the feed end, which is surrounded by an outer jacket to retain the cake until it can enter the kiln. With this type there is no feed pipe in the ordinary sense, so that there is no obstruction in the opening at the feed end of the kiln.

None of these feeders require circulating water, which is a marked advantage when the only water to be had is hard and scale-forming.

There has been no experience with any of these feeders at Thomaston, so that in a description of the filter installation at this plant their performance will not be discussed.

Interlocking Controls.—It would manifestly be undesirable to have the filters and belt-conveyor running when the kiln is stopped. To prevent this the drum-type kiln-speed controller has an extra set of contacts so wired that when this controller is set in the "off" position, the no-voltage release on the corresponding cake belt-conveyor motor operates. This in turn operates the no-voltage releases on the corresponding filter motors. The inclined screw is left running, as it is not advisable to stop it with a load in it. The same is true of the one pug-mill which is in use and will be mentioned later. The wiring is also so arranged that if the controller of the feed-screw motor opens because of overload or other reason, or if it is opened manually, the controllers of the corresponding pug-mill, belt-conveyor and filter motors will open also. Stoppage of the pug-mill motor will also stop the belt-conveyor and filter motors. Starting is accomplished by a push-button for each drive, operated by the filter attendant. This is a safety feature intended to lessen the chance of starting in case a man should be working on the equipment.

Vacuum Line and Pumps.—The pipe from the filters to the vacuum pumps is 12 in. in diameter, and is probably larger than is necessary, but it gives an additional receiver effect. It runs from the kiln building to the pump-room through an underground tunnel and rises to the pumps, and for this reason all that part in the tunnel would in time fill with condensed water, if steps were not taken to prevent it. The problem of draining out this water without introducing air did not seem capable of solution unless a wet vacuum pump in the tunnel were used, and we did not care to adopt this because of the first cost and the inconvenience and expense of operation. Finally we installed in the tunnel line a drip-pocket in which condensate could collect and drained this by a Crane-tilt 3-valve trap. Every time such a trap discharges it introduces its own volume of air into the system, and we were at first afraid that this might affect the

vacuum. The use of this trap has more than met expectations in two ways: (1) there is so much air coming from the filters that the additional volume introduced by the trap does not register on the recording vacuum-gage, and (2) condensation has proved to be much less than we had expected, so that the trap discharges only two or three times an hour. We think the use of this type of trap is a satisfactory solution of the problem of draining pockets in vacuum lines in filter installations.

The vacuum pumps are in duplicate (Fig. 5), but only one is used at a time. They are of the Sullivan angle type, have 18-in. by 8-in. cylinders, and are driven at 300 r.p.m. by 50-hp. Allis Chalmers synchronous motors. The piston displacement of each machine (both cylinders) is 1,408 cu.ft. per min. A recording vacuum-gage near the pumps draws a curve showing the vacuum maintained. There is an indicating vacuum-gage on each filter.

Disposal of Filtrate.—Each pair of filters per kiln has a common pick-up receiver and a common drying receiver, and in these the water and air are separated. The filters and receivers are nearly 50 ft. above ground-level, so that the water may be drawn off from the latter by means of barometric legs. The lower ends of these are immersed in one concrete sump tank, from which the filtrate is pumped back to the raw mill to be used in making more slurry (Fig. 6). This is done because, as has been mentioned, all water for the plant is purchased, so that conservation is in order. There is an overflow pipe in the sump so that the water may flow to waste if the pump is stopped, but this happens very infrequently. The arrangement is such that the pump can not lower the water level so far that the barometric legs will be unsealed.

A part of the hot water discharged from the water-jackets flows by gravity to the wash and change house, where it is used for washing and shower baths, but most of it empties into the same sump that receives the filtrate, and so the water that is returned to the raw mill for re-use is quite warm. It follows that the slurry is warm also, and this is an advantage in several ways. We think that warm slurry is ground somewhat more easily than cold. There is less likelihood of slurry pipes freezing in severe winter weather. Best of all, it is well known that warm slurry filters more easily than cold, so that the filters have more spare capacity. The upper limit to this is reached when the vapor tension of the water is so high that it lowers the vacuum. We have not encountered this condition.

Return of Dust.—Considerable dust is recovered from the bottom of the dust chambers into which the feed ends of the kilns project. Before the filters were installed this dust was sent to tanks on the feeding platform by a small Fuller-Kinyon pump. From these it was fed by small slow-moving screw-conveyors into the stream of slurry as it entered the feed pipe.

After the filters were put in this same arrangement was used to feed the dust slowly into the inclined conveyor so that it entered the kiln with the

cake. It was felt that perhaps the dust was not thoroughly mixed with the cake, and might be picked up with the draft and dropped in the dust chamber, thus constituting a sort of circulating load. One way of meeting this situation was developed at the plant of the Southwestern Portland Cement Co. at Osborn, O., where pug-mills are used to incorporate the dust with the cake.

We have placed a similar but shorter pug-mill between the filters and the feeder of one of our kilns (Fig. 4). The dust feeder is driven from the pug-mill shaft. In the earlier lay-out this dust screw was driven from the belt-conveyor head-pulley shaft. The pug-mill does an excellent job of mixing the dust and cake, and the feed entering the kiln is a granular, earthy-looking mass. While it is difficult to be sure of such small savings, we believe that this machine is causing dust to be retained in the kiln that would otherwise find its way back to the dust chamber.

Labor Required.—One man per shift is on the filter floor. He changes bags, makes all ordinary repairs, does his own oiling and greasing, washes out the tanks, and also looks after the feeder floor. While we were running on wet slurry we kept a man on the feeder floor to insure against feed-pipe stoppages, so that the new equipment really uses no more labor. The vacuum pumps are cared for by the regular operator in the switch-board and motor room, where the pumps are located. Bags that are worth reclaiming are repaired by the sewing-machine operators in the cement-bag-reclaiming department.

Repairs and Maintenance.—Practically no time has been lost because of the filter installation. On the rare occasions when the latter has given trouble we have by-passed it and fed wet slurry. Of the two conveyor belts, one of the original ones is still in use, with little indication of wear. The other did not wear out, but was ripped from end to end when half the splice broke, and the condition was not noticed in time. The inclined feed screws have been lasting about three months. They break off just below the lower bearing, probably through

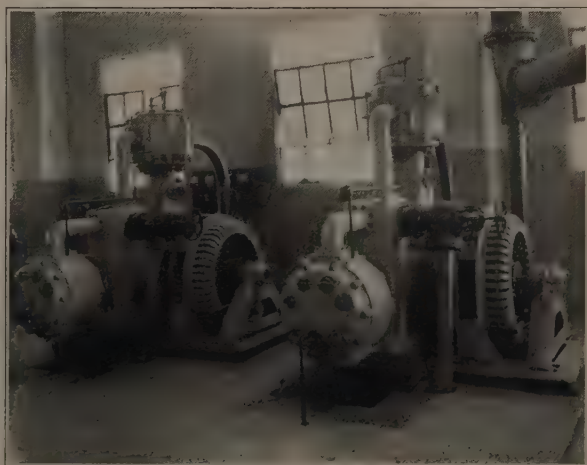


Fig. 5. The vacuum pumps.

vibration or reversal of flexure caused by the long overhanging portion. It takes about 2 hr. to change a screw, and a spare one is always kept ready for use. The only repair of consequence to the filters, except bag renewals, has been one replacement of the plug valves that connect the rows of sectors to the vacuum and pressure lines.

The bags are replaced without loss of slurry through the overflow pipes. The tanks are washed out at times when the kilns are on slow speed due to the falling out of rings or other reasons. At such times one of the two filters feeding each kiln is able to supply it, and the other can be washed out without loss of production.

Power Used.—The filter equipment for two kilns involves the use of the following motors:

4 2-hp. variable-speed d.-c. motors—one for each filter. These average about $\frac{2}{3}$ load.

2 5-hp. squirrel-cage motors—one for each belt-conveyor. These are about $\frac{1}{2}$ loaded.

1 25-hp. squirrel-cage motor driving the pug-mill of the No. 2 kiln. This is loaded to about 20 hp.

2 $7\frac{1}{2}$ -hp. squirrel-cage motors—one for each inclined feed-screw. These are usually about $\frac{1}{2}$ loaded, but recording watt-meter records show that they have occasional "peaks" up to full load.

1 50-hp. synchronous motor on the vacuum pump. This machine usually takes about 40 hp. There is a spare unit.

1 15-hp. squirrel-cage motor on the sump pump. This has shown a maximum of 9.8 hp., with an average of 6.7 hp. A $7\frac{1}{2}$ -hp. motor would probably be large enough, and a 10-hp. one would be ample.

Since these motors are fed from two distinct switchboard circuits, each of which also supplies a number of other machines, it has not been possible to ascertain their combined power consumption by wattmeter at one time, and so no statement of the power used, in terms of kw.-hr. per bbl. of clinker can be given other than the above figures for individual measurements.

Life of Bags.—There have been 1,540 bags used since the filters went into operation. Because of the conditions that have confronted all cement makers, the plant has not been run to capacity, but 2,286,000 bbl. of clinker have been made with the help of the filters. This means that 1,484 bbl. of clinker have been made per filter-bag worn out. We buy our bags ready-made, as we do not use enough to justify trying to make them ourselves, though this might be worth while in a larger plant. The average cost of the bags has been \$1.05 each delivered, so that the bag cost per barrel has been .071 c. The bags are being bought at a much lower price now.

Economic Results.—When the kiln building was designed it was felt that filters would later be installed, and provision for doing so was made by raising the roof over the feed ends of the kilns, the dimensions of the increased space being based on the best information available at the time. The change has proved to be adequate.

With this exception the total cost of everything involved in the filter installation was about \$80,000. The carrying charge or burden on this, taken at 15 per cent., comes to \$12,000 a year. The equipment is capable of producing 1,200,000 bbl. of clinker per year, so that the burden is 1 c. per bbl. when running at capacity.

It has already been shown that the operation of the filters involves practically no extra labor cost aside from that for repairing the bags and the replacement of feed-screws.

Before these machines were put in each kiln was able to produce 1,500 bbl. per day when given close attention. The feed was slurry carrying 33 to 34 per cent. of water. Now, with the filters in use, each kiln can turn out 1,750 bbl. per day without trouble or forcing, but persistent efforts to make them do more have been unsuccessful.

When running on wet slurry the fuel consumption of the kilns was 123 lb. of dry coal per bbl.

There was an immediate drop in this as soon as the filters went into commission. Continuous study of conditions has reduced the use of fuel to 108 lb. of dry coal per bbl., at which figure the kilns have been operating for a long time. This fuel consumption is arrived at first by calibration of the Bailey feeders, but reliance is not placed altogether on this, and the checking goes through the laboratory determination of the moisture in the wet coal back to a physical inventory of the coal pile and a knowledge of the tonnage of coal purchased. This method was in use before the filters were put in, and has been employed long enough to insure its correctness.

The economies resulting from increased output and lowered use of fuel are not reduced to cents per barrel here, because these vary widely among cement mills. It will be seen, however, that an increase of $16\frac{2}{3}$ per cent. in production is possible in normal times, which would bring about a proportionate reduction in overhead and certain other expenses, and might allow a profit on the added production. The amount of coal required has been reduced 12.2 per cent., and this can be given a money value when the cost of coal delivered at the plant and prepared for burning is used. In our case as the delivered cost of coal is quite high, the saving in fuel alone is enough to pay the first cost of the whole filter installation, including accessories, in less than 2 yr.

(Continued on page 40.)

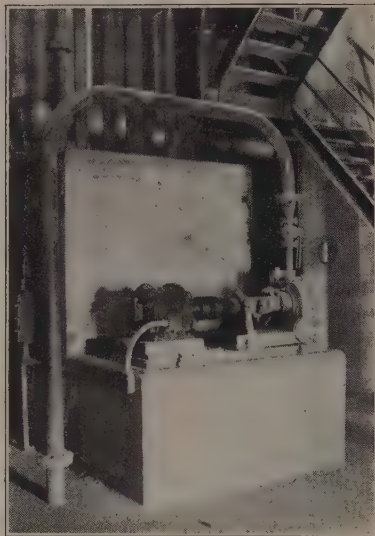


Fig. 6. The filtrate pump and sump.

New Method Developed to Produce Pure Carbon-Dioxide Gas and Lime

Production of Lime as a By-Product and Low Cost Dry Ice are Features

The possibility of profitably utilizing the waste carbon-dioxide gas generated in the production of lime is a subject which has been of intense interest to lime producers for a number of years. Carbon dioxide is used in the manufacture of dry ice or solidified carbon dioxide, which is being used in rapidly-increasing amounts as a refrigerant. Many systems for the production of this material from waste lime-kiln gases have been suggested and a few tried with little success. These systems have not become popular because it was attempted to apply them to existing vertical or rotary kilns, whose waste gases contained many impurities which must be removed and were so diluted with air that the gases could be purified only at a prohibitive cost. As these kilns also operated intermittently, it was impossible to secure a steady supply of dry ice from them. As a result, most of the carbon-dioxide gas now being used for this purpose is being manufactured by burning coke as a fuel for power and capturing the flue gases. The equipment required for this purpose and for the washing and purification of the gas is expensive and as a result dry ice has been expensive to manufacture and has not come into as general use as it would if a lower selling price were possible.

Dr. Edward P. Gillette, a well-known research engineer, and director of research of the Gillette Research Corp., Toledo, O., which was formed to adapt his inventions to commercial uses, has been at work on this problem for about five years. He, however, attacked the problem from a different point by developing a process in which the production of carbon-dioxide gas is the primary objective, the lime produced being a by-product. Approaching the problem in this manner Dr. Gillette first built a

small laboratory unit to test his theories. After several years of experimentation and improvement of this model the present unit, with a capacity of 4,000 lb. of carbon-dioxide gas daily, was erected a few months ago. This new method was comparatively unknown among lime producers, except in the vicinity of Bloomville, until the convention of the National Lime Assn. on June 29. In a paper presented at this meeting Dr. Gillette gave a brief description of his method. The process consists essentially of breaking down limestone through the medium of heat into its constituent compounds of lime and carbon-dioxide gas. Either oil or gas can be used as fuel.

With this unit it is claimed that a purer lime can be produced at a lower cost than formerly and that the CO_2 content of the lime can be controlled within 1 per cent. This makes it possible to produce special or chemical lime of any desired CO_2 content and of exceptional purity. The temperature in the kiln combustion chamber is kept somewhat higher than that in the ordinary vertical kiln, but this extra cost is said to be more than compensated for by the purity of the lime and the savings in the manufacture and processing of the gas. This method has the added advantage of being continuous.

It is stated that with the Gillette process dry ice can be produced at about one-fourth the present cost. This calculation is based on the experience of the company with its present unit, using a charge of 65 c. per ton for stone and a price of \$4 per ton for the lime produced. In addition to this saving in production cost of the dry ice, it is claimed that the first cost of a complete plant of the Gillette type is only about one-half that of existing plants using other methods.



Ratchet-driven roll-feeder under kiln.



Exterior of plant with skip-hoist in foreground.



One of the burners and combustion chambers.

Both Dr. Gillette and J. J. Erschel, president of the Woodville Lime Products Co., who is also president of the Gillette Research Corp., believe that the lime-plant operator is the logical producer of dry ice. It is pointed out that a lime producer can, by using this method, continue using his present raw material and produce a better product at lower cost and, in addition, obtain a by-product for which there is a steadily-growing market. Another reason for this belief is the fact that the lime industry has been suffering from overcapacity for many years and the erection of new plants primarily for the production of dry ice by other than existing lime producers would further demoralize the lime industry. The rapid growth of the dry ice industry is evident from the consumption during each of the past three years. In 1930 total consumption in the United States was 70,000,000 lb., in 1931 it was 90,000,000 lb., and in 1932 over 120,000,000 lb. was used. Considering the general business conditions during this period and the present high price of dry ice this record is impressive.

The installation at Woodville, O., occupies part of an unused building on the property of the Woodville Lime Products Co., where all the research work has been carried on. Waste limestone screenings and other stone up to $\frac{3}{4}$ in. in size and not suitable for use in an ordinary vertical lime kiln are used. The highest possible capacity with this method is obtained with stone from $\frac{1}{2}$ to $\frac{3}{4}$ in. in size, for material larger than this is not practical because of the physical limitations of the equipment used.

In the Woodville installation a small skip car elevates the raw material from a hopper to the top of the kiln, which consists of a vertical retort or tube inclosed by special silicon-carbide refractory plates which are efficient conductors of heat. These plates have no chemical affinity for limestone at the operating temperature used in this process and any fusing in the retorts is prevented. The calcining tube is 3 in. by 20 in. in section and 24 feet high. The stone is fed from a steel hopper at the top of the tube and descends slowly by gravity through the tube, the rate of travel being controlled by a feeder, which discharges the pebble lime from the bottom of the tube. Below the burning zone a short section of the tube forms a cooling chamber. The feeder below this chamber is of the rotary pocket type and is driven by a $\frac{1}{4}$ -hp. electric motor through a small speed-reducer and a ratchet wheel. A rider on the ratchet wheel allows the rate of discharge to be closely controlled and thus allows regulation of the calcining period. In this installation a wheel-barrow placed under the feeder catches the finished lime, which is piled at one side for storage or shipment.

Two vertical combustion chambers are used, one on each side of the tube. Each chamber has an oil-burner of the air-atomizing type equipped with individual fuel and air controls. A cheap grade of fuel oil is used. The combustion chambers taper towards the top and are made of firebrick insulated on the outside with asbestos concrete.

The carbon-dioxide gas is drawn off from the

middle portion of the retort into a chamber through openings inclined so that no stone or lime can be drawn out with the gas. In this installation no dry-ice manufacturing equipment has been installed, the gas produced being used merely for testing purposes. Repeated tests by qualified chemists have shown this gas to be suitable for the manufacture of first-grade dry ice after being passed through an ordinary bag filter. At present the gas is drawn from the chamber through a pipe and cooling coil immersed in water, the suction being furnished by a small centrifugal fan. It is claimed that the column of stone above the point where the gas is withdrawn and the lime below it prevent air infiltration to such an extent that a product over 99 per cent. pure is obtained. The operation is entirely automatic and continuous and any semi-skilled laborer can control it.

In promoting the use of these plants it is planned to furnish small standardized units with capacities ranging from 10 to 100 tons of carbon-dioxide gas in 24 hr. A 10-ton plant would consist of five tubes housed in one unit, each tube having its individual combustion chambers, burners and feeder, and being individually controlled. The operation of many small plants in strategic locations will also overcome the shipping difficulties which have been the most serious impediment to the growing use of dry ice. Plants will be licensed for exclusive restricted territories on a royalty basis. These territorial restrictions apply only to the CO₂ and the dry ice; there are no restrictions on the lime sales.

The first producer to enter this new field is the J. E. Baker Co. of York, Pa. This company has been licensed by the Gillette Research Corp. to erect gas-producing units in eastern Pennsylvania, Maryland and the District of Columbia. Bids are now being taken for the construction of the first unit at York.

Iowa Gravel Plant (from page 30)

was built near the plant. The flume now discharges to the sump and an 8-in. Kansas City Hay Press Co. centrifugal pump rehandles the waste to a more distant point. A 12-in. Dayton-Doud centrifugal pump at the far end of the waste pond furnishes wash-water for the plant through a 16-in. pipeline at the rate of 3,000 gal. per min.

These changes in the plant were made primarily to give a cleaner product but have also resulted in more accurate grading and an increase in the plant's capacity which is now 250 tons per hr. The changes were designed by M. G. Sullivan, of Milwaukee, Wis. who also designed the original plant. In the company's experience spray nozzles have been found to give a cleaner product than perforated or slotted pipes. The main office of L. G. Everist, Inc., is at 2100 E. Fourth St., Sioux City, Ia. H. H. Everist is president and general manager of the firm and H. C. Boswell is secretary and treasurer. Oscar Holiday is superintendent of the Hawarden plant.

Aggregate Producers are the Logical Makers of Asphalt Paving Mixes

West Process Pavement Co. Plans to Install Process in Aggregate Plants

THE growing use of and demand for low-cost pavements in the past few years has resulted in the development of many types of patented asphaltic mixtures. Much of this material was at first made in plants owned and operated by contractors or by cities, counties and other branches of government. The present trend, however, is toward the production of this material by the aggregate producer whose many advantages make him the logical manufacturer of it. Availability of suitable aggregates at the lowest possible cost and centralized location from which shipments can be made to important markets are among the important advantages.

W. C. West, president of the West Process Pavement Co., Inc., Louisville, Ky., was one of the first to sense the importance of the aggregate producer in this field. Five plants producing patented Westphalt paving material are now operated by the company at aggregate plants in five states within a few hundred miles of Louisville. These are located at Lancaster, Pa., Richmond, Va., Raleigh, N. C., Chattanooga, Tenn., and Bloomville, O. A sixth will soon be erected in Indiana. These plants are of the continuous type and are made in the company's shops. All are operated by the company so that direct supervision is possible. The plants are absolutely automatic in operation and the element of human error is practically eliminated. Because of the wide variety of aggregates used in these different localities valuable information has been obtained on the production of Westphalt. With the completion of the sixth plant it is Mr. West's intention to place plants erected in more distant locations in the hands of the producers themselves. The plants are designed so that they can readily be moved to other locations and can be set up ready to operate within 10 hr. time.

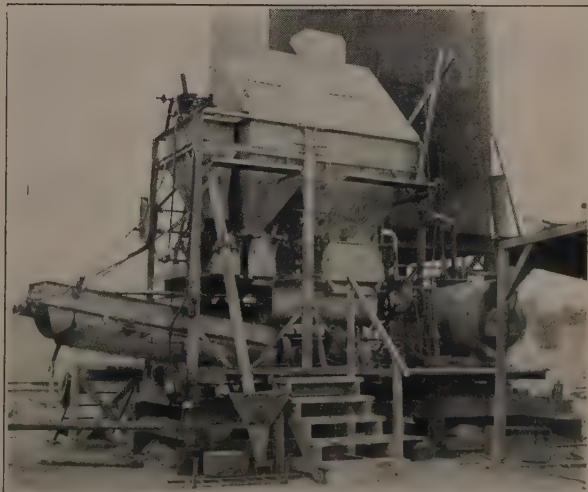
Westphalt is claimed to be the only "ship-cold, lay-hot" paving material on the market. It is a self-contained asphaltic mixture consisting of a graded mineral aggregate composed of such materials as stone screenings, crushed slag, crushed and uncrushed gravel and sand uniformly mixed with a mineral filler and unblended asphalts so proportioned that when heated just prior to laying, a true asphalt cement is formed, binding the mineral aggregate together. It is produced in three different surface textures known as Types B, C and D. Type B has the coarsest surface texture and is used where high-speed traffic prevails. Type C has a medium-coarse surface texture and is used on suburban roads and streets, drives, airports, etc. Type D has a smooth-surface texture and is generally

used in cities for new construction, resurfacing and patching.

In its shipping state Westphalt is a loose, uncompacted, granular mixture which may be stock-piled as long as desired without deterioration and reclaimed without difficulty from the stock-piles. Prior to laying it is heated on the job to a temperature of between 225 and 350 deg. F. The heating may be done in any suitable heater of the pan or cylinder type directly or indirectly heated by an oil-burner or in a non-tilting concrete mixer equipped with a suitable oil-burner. The hot material is laid in the usual manner. The use of both hot and cold asphalts in its manufacture allows absolute control of the penetration and makes the product ideally suited for shipment, as the two types of asphalt do not blend until heated for laying.

All the plants now in operation are similar in type but differ in capacity. The one at Bloomville, O., has a capacity of 40 tons per hr. and is exceedingly compact for a continuous mixing plant. It is located in the quarry of the France Stone Co. at Bloomville and uses stone screenings from that plant.

The aggregates are delivered to two stock-piles at the plant, one for coarse and one for fine material. Two Link-Belt chain-bucket elevators rehandle these materials to the two plant aggregate hoppers, of 3-ton capacity for the coarse, and 1-ton capacity for the fine material. Draver ratchet-controlled rotary feeders made by the Gump Co. discharge from these bins. Pulverized hard asphalt used to bring the penetration down to the de-



The West Process Pavement Co.'s plant at the Bloomville, O., quarry of the France Stone Co.

sired specification is dumped by hand in to a small hopper, from which a 5-in.-diameter inclined screw-conveyor feeds it to a third feed hopper of 500-lb. capacity. This hopper also has a rotary feeder. The feed hoppers are not designed as storage hoppers but as balancing units having sufficient capacity to compensate for minor delays.

The asphalt used is received in tank cars and is heated in the cars to a pumpable temperature of 225 deg. F. by steam from a Cleaver tank-car heater fired with fuel oil. A Blackner Co. steam-jacketed rotary asphalt pump draws from the car and pumps to a cylindrical booster tank. This has tubes similar to those of a steam boiler and is fitted with Hauck burners which bring the temperature to a point between 325 and 375 deg. F. The same pump feeds under pressure through a pipe to a National Meter Co. pressure-control valve which maintains a back pressure of from 10 to 15 lb. per sq. in. The pump has several times the required capacity and the excess asphalt by-passes the relief valve and is returned to the car. The heat of this returned material helps maintain a high temperature in the car. Even when operating at full capacity there is an overflow, and when not operating, all the asphalt is returned to the car.

The first mixing unit is a 14-in.-diameter paddle conveyor 6 ft. long. Fine and coarse aggregates are fed directly to this conveyor and the hot asphalt is introduced through spray nozzles. The paddle conveyor discharges into a 10-ft. pug-mill having two opposed paddles of 16-in. diameter. The pulverized hard asphalt is introduced into the pug-mill at a point one-third down its length. The pug-mill is also fitted with spray nozzles for the hot asphalt and these, with those in the paddle conveyor, can be shut off individually, allowing the mixing time to be varied to suit different types of materials.

The pug-mill discharges to a Jeffrey No. 30, 16-in. by 30-ft., portable electrically-driven belt-conveyor. This can be swung to feed direct to cars or trucks for shipment or to stock-piles. Stock-piles are always maintained for several months' expected demand. The plant is operated continuously until sufficient stock is on hand and is then shut down until the stock-piles require replenishment. Loading from the stock-piles is done by a crane. Although designed for the production of Westphalt, these plants can produce any type of asphalt pavement specified in any state.

The entire plant is operated by a 6-cyl., 35-hp. Waukesha gasoline engine. A double roller-chain drives a shaft from which each unit is individually chain-driven. All sprockets, chain, wheels, gears and bearings in the plant were furnished by the Link-Belt Co. A sheet-metal building alongside the plant houses the office, tool room, pulverized-asphalt storage and a laboratory which is equipped to make all the tests specified by the state highway department.

F. H. Donaldson was in charge of the erection of this plant and has superintended its operations since it went into operation early in May of this year. Mr. Donaldson will leave soon to erect another plant in Indiana for the company.

Aggregates Code (from page 28)

Bros. Gravel Co.), Thomas Cobb, Jr., Charles Rosenbarger (of the Brown-Rosenbarger Gravel Co.), and Charles B. Kennedy (of the Associated General Contractors). One southern portable-plant operator stated that his plant output ranges from 5 to 10 tons per man per 10-hr. day, whereas permanent plants can produce from 40 to 80 tons per man per 10-hr. day.

J. Bruce Cramer repeated his objections previously expressed at the committee's open meetings and presented telegrams from state highway departments showing the extent of portable-plant use in their road-building work. He was followed by W. Cornwell, also representing the Rock Crusher Manufacturers' Assn., who drew attention to the \$7,000,000 invested in factories and equipment by the makers of portable plants and to the even larger sum invested in portable plants by those who operate them. Both investments would be wiped out, he asserted, if Article V were allowed to become operative.

Col. Willard T. Chevalier, representing Mr. Muir, met members of the Committee on Organization Monday night. As a result it was decided to make no change in Article V as presented.

Article VI.—When Mr. Graves had presented the changes embodied in the amended Article VI, *Unfair Competitive Practices*, John J. Moreschi, the American Federation of Labor representative, objected to Sec. 10, *Enticement of Employees*; to Sec. 11, *Accident Prevention* (advocating the elimination of the words "be permitted to," "unnecessarily," and "flagrant"); and to Sec. 14, *Child Labor* (wherein he would raise the age limit from 16 to 18 years).

Article VII and Appendix I.—No changes were offered for Article VII, *Changes in the Code*.

Appendix I as presented embodies two changes. The phrase "(including that portion of the Ohio River south of the State of Ohio)" was removed from "Region No. 7," and the phrase "(including that portion of the Ohio River south of these two states)" was taken out of "Region No. 8."

Slurry Filters (from page 36)

The matter of putting in filters is not one that can be handled wholesale. It is a problem that must be solved individually for each plant. The mechanical questions involved may be easily worked out in some cases or may be almost insurmountable in others, and the first cost may be moderate or quite high. Increased production may be had, but perhaps in some cases it is not wanted and can not be taken advantage of. A saving in fuel is almost certain, but fuel may be dear or very cheap, and in some cases economy in its use may not be as important a matter as in others. The purpose of this paper is to detail the experience of one plant with filters, and it is hoped that it may be of some help to others who are giving thought to them as a means of reducing manufacturing cost.

MEN OF THE INDUSTRY



CHARLES M. DOOLITTLE

CHARLES M. DOOLITTLE, president of the Canada Crushed Stone Corp., Ltd., Hamilton, Ont., largest producer of crushed stone in Canada, and its associated companies, the Queenston Quarry, Ltd., and Puslinch Quarry, Ltd., has a long and enviable record in this industry. He was born on Sept. 2, 1876, and received most of his education in Canada. After completing a mining course at Queen's University he devoted his time to mining in Northern Ontario until 1904, when he started a stone quarry at Rymal, Ont. He acquired the present Dundas quarry in 1905 and has since added four others at Hagersville, Vinemount, Puslinch, and Queenston. He has also for many years been a regional vice-president of the National Crushed Stone Assn. and has been active in its affairs.



Personal Mention

Albert Moyer was elected president of the Vulcanite Portland Cement Co., New York City, at a meeting of the board of directors on August 17. Mr. Moyer, who was formerly sales manager and assistant to the president, succeeds the late W. D. Lober in this position.

W. H. Klein has been appointed general operating manager of all the plants of the Pennsylvania-Dixie Cement Corp., and will make his headquarters at Nazareth, Pa., according to an announcement issued by Blaine S. Smith, president. Mr. Klein has for years been general manager of the Southern Division of the company, with headquarters at Chattanooga, Tenn.

Willard T. Chevalier, publishing director of *Engineering News Record*, has been named industrial advisor to the NRA for the crushed-stone, sand-and-gravel and slag industries.

Carroll W. Brown, former treasurer of the Industrial Brownhoist Corp., and associated with that company for 30 years prior to his resignation last year, has been appointed assistant to Joseph B. Eastman, federal co-ordinator of transportation.

Charles H. Garity of Catonsville, Md., has been appointed by the Tennessee Valley Authority as its director of purchases and procurement. Mr. Garity has had a wide experience in the hardware, mill supply and general machinery lines and has held many important positions. His latest connection was as purchasing agent and office manager on the Safe Harbor hydro-electric project of the Arundel Corp. of Baltimore. The government developments at Muscle Shoals, Ala., also come under his authority in his new position.

Geo. W. Gauntlett was recently elected president and general manager of the Pioneer Sand & Gravel Co., Seattle, Wash., succeeding B. F. Morris.

Sidney P. Armsby, who was for many years service director for the Haden Lime Co., Houston, Tex., is now in charge of the development of lime sales for the California Chemical Corp., San Francisco, Cal.

Obituary

W. A. Bechtel, 61, president of Six Companies, Inc., builders of Boulder Dam, died on Aug. 28 in Moscow, U. S. S. R., while on a tour of Europe. Mr.

Bechtel was also interested in the Bechtel-Kaiser Rock Co., Oakland, Cal., and the Kaiser Paving Co. of the same city.

Dr. Frank Van Horn, 61, athletic director and professor of geology at the Case School of Applied Science for 26 years, died on Aug. 1 in Cleveland, O. Dr. Van Horn was an authority on mineralogy and was secretary of the Mineralogical Society of America.

William O. Flyte, 70, veteran Pennsylvania slate quarryman, died on August 17 at Freemansburg, Pa.

Ricardo Rezola, owner of Cementos Rezola, San Sebastian, Spain, one of the largest producers of cement in that country, died recently.

Marshall Beck, 45, secretary and treasurer of the Great Lakes Portland Cement Corp., Buffalo, N. Y., died on July 28 from burns received when fire broke out in his home in that city.

Frank W. Peek, Jr., 49, chief engineer of the Pittsfield, Mass., works of the General Electric Co., was killed on July 26 when his automobile was struck by a train near Gascones, on the Gaspe peninsula of Canada.

Morris Fortuin, general manager of the northern division of the Pennsylvania-Dixie Cement Corp., died on Aug. 22 at his summer home near Nazareth, Pa., after an illness of 8 months. Surviving are his wife, a daughter, two sons, two brothers and three sisters.

Mr. Fortuin began his career in the cement field with the Rosendale Natural Cement Industry, later joining the Pennsylvania Cement Co. when it was organized in 1898. With this company he rose to the position of vice-president and general manager and when his company became part of the Pennsylvania-Dixie Cement Corp. in 1926 he was appointed to the position he held until his death. He also had a number of other business interests and was also prominent in the political and civic life of Nazareth. Safety work also received much of his attention and he was a past president of the Lehigh Valley Safety Council.

Link-Belt Combines Two Purchasing Departments

The purchasing department of the Caldwell-Moore plant of the Link-Belt Co., Chicago, has been moved to the company's plant at 300 W. Pershing Road. All purchasing for the two plants is now combined under the supervision of Henry M. Coen, purchasing agent.

Ohio Equipment Dealer Moves to New Building

The Milburn Machinery Co., Columbus, O., announces its removal to its new building at 1057 West Goodale Blvd., where, it is said, improved facilities and enlarged space enable the company to give more complete service and a broader selection of lines of equipment.

O. W. Thaleg Now Chicago Equipment Distributor

The firm of Thaleg & Co. was recently formed with offices at 835 Old Colony Bldg., Chicago, Ill. Equipment used in the non-metallic mineral industries will be handled. O. W. Thaleg, who is well known to producers in this field, heads the new company.

G. E. New York Offices Moved to Own Building

The General Electric Co. and four of its associated companies have announced the removal of their offices in New York City to the new General Electric Bldg., 570 Lexington Ave. at 51st St. Included are the executive offices, New York district office, air conditioning department, electric refrigeration department, Atlantic division of the Incandescent Lamp Department, Merchandise Department, and Plastics Department of the General Electric Company, and the General Electric Contracts Corp., G. E. Employees Securities Corp., General Electric Realty Corp., and International General Electric Co., Inc. New York City headquarters were formerly at 120 Broadway, where for 15 years three complete floors were occupied. Approximately 50 per cent. of the new 50-story building is occupied by the company.

Coming Events

October 2-6, 1933, Chicago, Ill.—Twenty-second Annual Safety Congress, National Safety Council, Stevens Hotel. W. H. Cameron, secretary, 20 N. Wacker Drive, Chicago, Ill.

Latest Portland-Cement Statistics

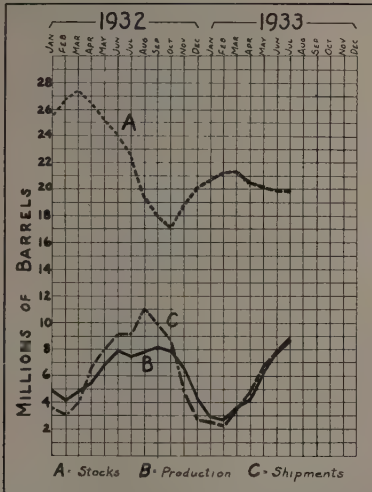


Chart showing monthly production, shipments and stocks on hand at end of month from January, 1932, to July, 1933.

THE Portland-cement industry in July, 1933, produced 8,609,000 bbl., shipped 8,697,000 bbl. from the mills, and had in stock at the end of the month 19,848,000 bbl. Production of Portland cement in July, 1933, showed an increase of 12.4 per cent. and shipments a decrease of 5.7 per cent., as compared with July, 1932. Portland-cement stocks at mills were 11.8 per cent. lower than a year ago. The mill value of the shipments, 27,927,000 bbl., in the first half of 1933 is estimated as \$35,270,000.

The statistics here given are compiled from reports for July, received by the Bureau of Mines, from all manufacturing plants except three, for which estimates have been included in lieu of actual returns.

In the following statement of relation of production to capacity the total output of finished cement is compared with the estimated capacity of 164 plants at the close of July, 1933, and of 165 plants at the close of July, 1932.

RATIO (per cent.) OF PRODUCTION TO CAPACITY

	July		June	May	April
	1932	1933	1933	1933	1933
The month..	33.4	37.6	35.2	27.4	18.9
The 12 months ended	34.2	26.3	26.0	26.0	26.2

PRODUCTION, SHIPMENTS, AND STOCKS OF FINISHED PORTLAND CEMENT, BY MONTHS, IN 1932 AND 1933 (In thousands of barrels)

Month	Production		Shipments		Stocks	
	1932	1933	1932	1933	1932	1933
January	5,026	2,958	3,393	2,502	25,778	20,624
February	3,971	2,777	3,118	2,278	26,657	21,125
March	4,847	3,684	3,973	3,510	27,545	21,298
April	5,478	4,183	6,536	4,949	26,496	20,542
May	6,913	6,262	8,020	6,709	25,394	20,117
June	7,921	7,804	9,264	7,979	24,043	19,936
July	7,659	8,609	9,218	8,697	22,512	19,848
August	7,835		10,968		19,398	
September	8,210		9,725		17,878	
October	7,939		4,782		17,084	
November	6,462		2,835		18,788	
December	4,248				20,205	
Totals	76,509		80,579			

PRODUCTION AND STOCKS OF CLINKER BY MONTHS, IN 1932 AND 1933 (In thousands of barrels)

Month	Production		Stocks		Month	Production		Stocks	
	1932	1933	1932	1933		1932	1933	1932	1933
January	6,107	3,036	8,184	6,092	July	6,613	8,569	7,889	6,839
February	5,176	3,110	9,375	6,422	August	7,078		7,175	
March	5,443	4,147	10,025	6,890	September	7,703		6,708	
April	5,924	4,520	10,511	7,146	October	7,259		6,093	
May	6,273	5,848	9,922	6,769	November	6,290		5,938	
June	6,803	7,836	8,877	6,840	December	4,335		5,995	

a Revised.

DISTRIBUTION OF CEMENT

Shipped to—	May (a)		June (b)		Shipped to—	May (a)		June (b)	
	1932	1933	1932	1933		1932	1933	1932	1933
Alabama	26,007	130,896	30,451	128,627	New Jersey	354,171	252,625	310,576	243,872
Alaska	2,259	903	2,680	924	New Mexico	20,550	11,972	16,937	7,737
Arizona	15,430	13,226	16,050	10,014	New York	1,095,796	874,417	1,287,121	1,070,796
Arkansas	17,496	83,686	18,623	58,681	North Carolina	32,396	41,121	30,921	46,758
California	400,264	489,827	461,266	473,303	North Dakota	22,113	17,159	24,956	24,427
Colorado	60,878	30,148	66,933	34,690	Ohio	392,409	292,022	525,399	389,377
Connecticut	114,826	123,156	91,080	104,706	Oklahoma	124,276	155,381	105,703	150,303
Delaware	38,984	47,636	34,906	31,197	Oregon	58,860	44,353	40,056	43,263
Dist. of Col.	94,829	91,904	88,395	94,539	Pennsylvania	450,430	498,529	461,699	659,913
Florida	33,183	73,109	36,600	54,942	Porto Rico	4,875	7,191	4,350	6,250
Georgia	93,256	53,172	100,778	37,634	Rhode Island	37,280	47,818	36,789	56,332
Hawaii	26,370	11,044	23,787	12,717	South Carolina	43,529	26,530	50,320	17,301
Idaho	10,963	11,455	10,241	11,586	South Dakota	20,924	34,370	28,654	19,494
Illinois	703,571	177,861	815,496	347,314	Tennessee	103,203	128,277	88,321	109,169
Indiana	310,262	172,464	410,735	350,728	Texas	358,964	360,532	333,082	339,004
Iowa	182,684	193,695	257,084	187,840	Utah	16,116	15,926	9,655	17,867
Kansas	127,363	81,970	159,469	92,726	Vermont	25,911	13,794	38,453	9,655
Kentucky	127,033	149,151	87,771	179,812	Virginia	88,465	100,649	82,323	117,078
Louisiana	79,682	64,344	129,428	59,178	West Virginia	86,484	54,844	101,063	59,554
Maine	36,870	33,625	64,934	60,431	Wisconsin	227,413	178,181	394,935	328,486
Maryland	168,539	78,427	148,637	78,909	Wyoming	10,626	8,131	10,467	8,377
Massachusetts	249,071	193,170	253,183	220,410	Unspecified	7,466	5,235	11,394	58,745
Michigan	304,783	295,721	488,650	514,119					
Minnesota	348,504	210,463	588,156	235,967					
Mississippi	14,928	50,882	21,757	89,638	Foreign	7,983,982	6,634,362	9,242,279	7,881,231
Missouri	442,726	227,115	456,782	317,173	countries	30,018	74,638	21,721	97,769
Montana	12,840	20,183	14,670	23,068					
Nebraska	71,205	225,751	86,083	135,231	Total shipped				
Nevada	47,891	51,316	74,982	61,124	from cement				
New Hampshire	20,082	26,225	21,685	27,171	plants	8,020,000	66,709,000	9,264,000	7,979,000

a Includes estimated distribution of shipments from 3 mills.

b Includes estimated distribution of shipments from 4 mills in 1932 and 3 mills in 1933.

PRODUCTION AND STOCKS OF CLINKER (Ungrind Cement), BY DISTRICTS, IN JULY, 1932 AND 1933 (In thousands of barrels)

District	Production		Stocks at end of Month	
	1932	1933	1932	1933
Eastern Pa., N. J., and Md.	1,174	1,677	1,113	971
New York and Maine	640	796	599	324
Ohio, Western Pa., and W. Va.	574	975	826	673
Mich., Ill., Ind., and Ky.	427	518	1,074	960
Wis., Ill., Ind., and Ky.	883	1,168	746	838
Va., Tenn., Ala., Ga., Fla., and La.	320	713	434	452
Eastern Mo., Ia., Minn., and S. Dak.	1,032	971	504	390
W. Mo., Neb., Kan., Okla., and Ark.	587	584	589	232
Texas	245	255	257	171
Colo., Mont., Utah, Wyo., and Idaho	182	124	220	247
California	401	629	1,309	1,306
Oregon and Washington	148	159	218	275
Totals	6,613	8,569	7,889	6,839

a Revised

PRODUCTION, SHIPMENTS, AND STOCKS OF FINISHED PORTLAND CEMENT, BY DISTRICTS, IN JULY, 1932 AND 1933, AND STOCKS IN JUNE, 1933 (In thousands of barrels)

District	Production		Shipments		Stocks at End of Month		Stocks at End of June (a)
	1932	1933	1932	1933	1932	1933	
Eastern Pa., N. J., and Md.	1,162	1,674	1,744	1,656	4,564	3,875	3,858
New York and Maine	809	784	860	744	1,647	1,334	1,293
Ohio, Western Pa., and W. Va.	1,063	790	946	790	2,705	2,757	2,640
Mich., Ill., Ind., and Ky.	571	490	644	614	2,007	1,443	1,567
Wis., Ill., Ind., and Ky.	1,144	1,147	1,666	1,632	2,750	1,974	2,459
Va., Tenn., Ala., Ga., Fla., and La.	322	718	493	555	1,659	1,614	1,451
Eastern Mo., Ia., Minn., and S. Dak.	1,143	964	1,439	968	2,922	2,661	2,665
W. Mo., Neb., Kan., Okla., and Ark.	789	618	511	532	1,547	1,379	1,294
Texas	274	274	307	237	667	765	728
Colo., Mont., Utah, Wyo., and Idaho	111	116	99	134	417	477	495
California	584	643	510	593	1,049	1,132	1,081
Oregon and Washington	164	118	155	86	578	437	405
Totals	7,659	8,609	9,218	8,697	22,512	19,848	19,936

Aggregates Statistics

COMPLETE statistical coverage of the crushed-stone, sand-and-gravel, and furnace-slag industries involves the use of several thousands of questionnaires, at best a long and tedious job. Experience has shown that reasonably-accurate estimates of annual production of these commodities can be made shortly after the close of the year by correlating railway shipments, market indicators, and partial returns from producers with statistical records for previous years.

Current production trends, however, are more difficult to approximate.

By H. H. HUGHES

Bureau of Mines, Department of Commerce

Data on railway shipments provide a quarterly check on activity in the aggregates industries, and this information has been summarized in previous installments of this series. At present monthly data relating to the aggregates industries are limited to indicators of demand. For example, concrete-pavement contract awards, Portland-cement shipments, and asphalt demand—all available monthly—indicate the magnitude of markets for crushed stone, sand and gravel, and slag in highway, street, and alley construction.

The accompanying table shows the correlation between annual production figures and market indicators for the ten years from 1923 to 1932. Sources of the data are listed in the footnotes and need not be repeated here. All data are expressed in terms of index numbers on the basis of the 1923-1925 average equalling 100. This device is used to permit direct comparison between unlike units. For example, square yards of concrete pavement when expressed as index numbers can be compared directly to tons of paving gravel, sand, crushed stone, or slag. Correlation between production and consumption indexes of course is not exact, but a study of the data will reveal trends and relationships.

The asphalt industry apparently has held up better than the cement. Paving gravel has maintained a much higher level than paving sand. Both these conditions may reflect activity

in secondary-road construction. The drop in building gravel and sand production is exceeded only by the drop in the indexes of total building and residential construction. The trend of total production of crushed stone, sand and gravel, and slag reflects a composite of paving and building.

Activity in the various branches of the glass industry has a direct influence on the sales of glass sand. Molding-sand sales parallel closely the production of malleable and gray-iron castings. The production of pig iron is a good indicator of the demand for fluxing stone.

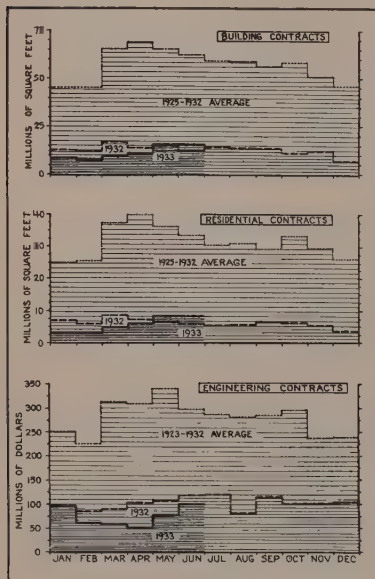


Fig. 1. Building construction in 1932 and 1933 compared with past experience.

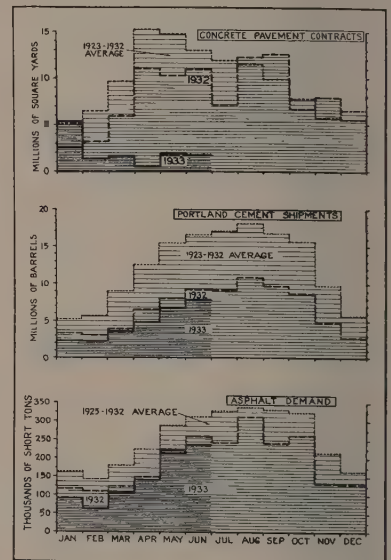


Fig. 2. Indicators of activity in highway construction in 1932 and 1933 compared with past.

INDEX NUMBERS SHOWING CORRELATION OF CRUSHED-STONE, SAND-AND-GRAVEL, AND FURNACE-SLAG PRODUCTION WITH CURRENT INDICATORS OF DEMAND, 1923-1925. (Average=100. (a)

Year	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)
1923	86	93	(n)	90	77	89	83	94	(n)	90	(n)	(n)	88	(n)	115	85	83	110	(n)	112	111	113
1924	100	100	(n)	99	101	101	104	99	(n)	100	(n)	(n)	93	(n)	89	87	99	89	(n)	88	87	86
1925	114	107	111	111	122	110	112	108	110	110	120	120	119	(n)	87	112	107	102	(n)	100	101	100
1926	117	111	102	131	120	117	105	108	110	117	113	112	132	100	90	123	104	100	(n)	106	109	105
1927	137	117	125	154	174	137	104	97	119	131	109	106	151	103	83	106	100	90	(n)	83	101	95
1928	161	120	114	168	172	130	119	109	128	135	124	122	166	116	93	125	105	100	(n)	96	105	102
1929	152	116	123	206	200	133	111	98	144	142	101	83	184	119	96	144	102	106	(n)	124	118	107
1930	159	109	105	220	178	130	98	80	169	130	65	49	147	111	96	101	85	67	67	67	87	75
1931	147	87	92	184	134	115	74	60	128	103	47	41	114	100	55	83	77	40	45	43	51	44
1932	105	55	75	1360	790	750	320	260	92	630	20	16	57	84	35	50	620	22	31	270	24	180

a Most of the indicators used in this table are available monthly in *The Survey of Current Business*, published by the U. S. Dept. of Commerce. b Portland Cement Assn. c U. S. Bureau of Mines. d National Slag Assn. e Weighted index of columns 4-9, inclusive. f F. W. Dodge Corp. g *Engineering News-Record*. h Glass Container Assn. i Illuminating Glassware Guild. j Plate Glass Mfrs. of America. k U. S. Bureau of the Census. l Gray Iron Institute, Inc. m *Iron Age*. n Comparable figures for earlier years not available, index numbers calculated to show probable relationships on a theoretical 1923-1925 base. o Estimated.

The accompanying charts show trends in these indicator industries during 1933. Fig. 1 depicts the continued lows in building construction of all types. The wide gap between the 8- or 10-yr. average and activity in 1932 or 1933 is especially striking.

The most significant feature of Fig. 2 is the stagnation in concrete-pavement awards since January, 1933. The release of funds under the provisions of the National Industrial Recovery Act should cause a sharp rise in the 1933 curve before the end of the year. The relatively-slight difference between 1932 and the 1923-1925 average probably is due to unemployment-relief highway programs. The regular seasonal pattern of cement shipments and asphalt demand has been maintained throughout 1932 and 1933, although the volume has fallen considerably. The high level of the asphalt curve is due no doubt to the volume of secondary-road construction and prepared-roofing manufacture both which have been well sustained during the depression.

The spurt in pig-iron production during the second quarter of 1933 is shown in Fig. 3. Fluxing-stone producers no doubt are benefitting by this increased activity. Production of castings shows a similar increase which must be reflected in the demand for molding sand. The curve for gray-iron castings is slightly misleading in that it shows average tons per foundry rather than total output. No correction has been made in the statistics for any decrease in the number of foundries in operation.

The glass-containers industry apparently has been relatively active during the depression, according to the curve in Fig. 4, but the production of illuminating glassware has dropped considerably. Polished plate-glass production exceeded the 1923-1932 average in June, 1933. This no doubt is

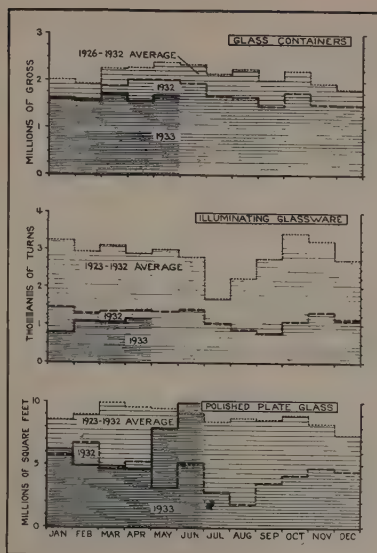


Fig. 4. Indicators of demand for glass, grinding and polishing sand in 1932 and 1933 compared with past experience.

due to the busy second quarter in the automobile industry. Plate-glass output is an indicator of the demand for grinding and polishing sand as well as that for glass sand.

Current barometers less closely related to the actual production of crushed stone, sand and gravel, and slag may be indicative of market trends in some of the other uses of these materials. Car-loadings may indicate the markets for engine sand and possibly even for railroad ballast. The purchasing power of the farmer bears some relation to the sales of agricultural limestone. Shipments of prepared roofing show the consumption of roofing granules. These indicators, however, are less significant than those shown on the charts.

The data plotted in Figs. 1 to 4 as well as those of lesser significance indicate a general increase in the demand for crushed stone, sand and gravel, and slag during the second quarter of 1933.

Eugene F. Olsen Heads New Equipment Firm

Announcement is made of the formation of the Eugene F. Olsen Co. of Adrian, Mich. This company is organized for the purpose of manufacturing and selling equipment of special interest to the concrete products industry and the sand and gravel industry. For the present at least, no equipment directly competitive with anything on the market in the past will be made by the company. It will specialize on entirely new developments and items offering new sources of profit to the sand and gravel producer and the concrete industry.

The Eugene F. Olsen Company reports that an astonishing amount of interest is being shown in their recently announced Neff & Fry surface sepulcher. According to this company

it is strikingly apparent that there are a large number of concerns now manufacturing concrete products of some kind or in the concrete aggregate business who feel that there is still an immense field for the use of concrete in new ways.

In addition to the large field offered by concrete vaults of the conventional type, the Neff & Fry surface-sepulcher draws into the concrete field large amounts of money that have heretofore been spent for monuments and other natural stone memorials.

Eugene F. Olsen, who heads this new organization, was for many years president of the Anchor Concrete Machinery Co., later president of the Consolidated Concrete Machinery Corp., and vice-president of the Besser Manufacturing Co., all producers of concrete products equipment.

What Manufacturers Go Through to Get Business

Just to show that there is business to be secured if one will go after it the following letter is reprinted.

Cleveland, Ohio,
August 24, 1933.

To the Editor:

Just to pass along to you that I am again back in the dear old U. S., after having had quite an experience in the past five weeks. I went to Cuba and got caught in the revolution. Being down there with my car, I had to drive 600 mi. through war-torn Cuba, and what a time I had!

One advantage was that the soldiers treated us very well and would get gasoline for us at the various cities. Otherwise, I would not have been able to get through. When we got to Havana we were right in the midst of it. Picture me living one week on crackers and beans!

However, we finally got out and now I am back here on the job, and brought back the largest dust-collecting order we have ever had, for the Cuban-American Manganese Corp. You will probably remember our old friend, Lindley C. Morton, who built the Phoenix cement plant at Birmingham. He is now interested in this manganese plant and we are going to do an honest-to-goodness job.

It is a standard steam-shovel mining operation with narrow-gage railroad to the crusher house, and at the crusher house they have a Traylor 54-in. by 48-in. jaw crusher. Then this material is fed on an inclined belt up to a Symons crusher, then a Marcy ball-mill grinds it into fines, and from this point on it is standard mining practice of flotation. After the materials are separated it is put on a sinter bed of Dwight Lloyd Co., which makes the manganese sinter.

NORTHERN BLOWER CO.
M. A. Eiben, President

Correction

In the list of producers represented at the Chicago code meetings, published in the August issue of PIT AND QUARRY (p. 31 to 35), there were two errors.

In one case the annual production capacity of the Flint Sand & Gravel Co.'s 5 sand-and-gravel plants was given at 19,750 tons. As this is the daily capacity, the annual figure, based on an estimated 250 days' operation, would be 5,937,500 tons.

In the other case the New Haven Trap Rock Co.'s annual production capacity was given as 250,000 instead of 750,000 tons.

In both cases the figures published in the 1933 PIT AND QUARRY DIRECTORY were correct. The errors in PIT AND QUARRY arose from slips in transcribing.

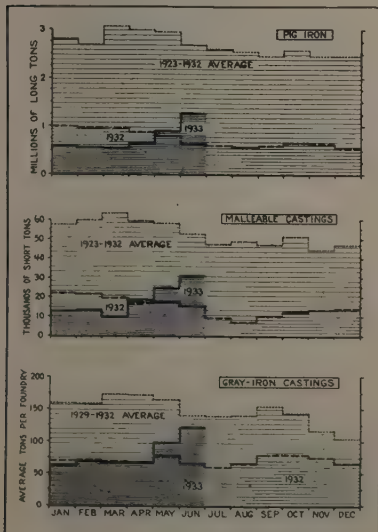


Fig. 3. Indicators of demand for fluxing stone and molding sand in 1932 and 1933 compared with past experience.

Traffic News and Comment

Recent I. C. C. Decisions

Cement. Reparation of \$12.54 has been awarded on finding that the rate charged on cement from York, Pa., to Trident, Mont., was inapplicable and that the applicable rate was 43½ c. plus 1 c. emergency charge. The point in question in this case was the applicability of the combination rule. In disposing of the case the Commission was divided in its opinion, five members voting for the award and five against. This made it necessary to call in Commissioner Eastman who is now Federal Coordinator of Transportation. His vote decided the case in favor of the complainant shipper. This case has drawn a caustic editorial from one prominent traffic writer on account of the time spent by eleven commissioners who are each drawing a salary of \$8,500.00 per year, in reaching a decision involving so small an amount. However, with the commission it is not a question of the amount involved as the principal of rate making involved. The dissenting commissioners were, Tate, Mehaffie, Brainerd and Lee. I. C. C. Docket No. 25,376, *Medusa Portland Cement Co. v. A. A. et al.*

In response to fourth section application No. 14,990, the commission has granted relief from the long and short haul clause of the fourth section on proportional rates on cement from St. Louis, Mo., and E. St. Louis, Ill., to Ada, Okla., and Okay Jet., Ark., rates to be constructed on a basis of 4½ c. under the local rates from and to the same points. Rates so constructed shall not exceed the aggregate of the intermediates, and shall be subject to a 50 per cent. circuitry limitation. F. S. O. No. 11,336.

Crushed Stone.—In response to fourth section applications No. 14,794 and 14,964, relief from the long and short haul clause of the fourth section has been granted in connection with rates on crushed stone or marble (terrazzo aggregate) over all routes between points in southern territory on the one hand and points in trunk line including Buffalo-Pittsburgh territory, and New England territory on the other hand. Relief is subject to observation of the aggregates of intermediates clause and that the rates so established shall not exceed the rates prescribed in 128 I. C. C. 567. F. S. O. No. 11,315.

Sand and Gravel.—Fourth section relief has been granted in connection with rates on sand and gravel between points in the Southwest as authorized in 177 I. C. C. 621, with the limitation that rates to higher rated intermediate points shall not exceed the rates prescribed in the decision cited, that they shall not exceed the aggregate of the intermediates, and subject to the 33¼-

50- and 70-per cent circuitry limitations. Relief is also granted on rates on ground oyster shell screenings and on ground limestone. F. S. O. No. 11,317.

After reconsideration the commission has amended the original report in 190 I. C. C. 465, covering the rates in the past on sand and gravel from La Grange, Mo., to destinations in Illinois, changing finding No. 3 to read as follows: "We find that the class E rates assailed from La Grange and Reading and the 111 and 126 cent commodity rates from La Grange to the key destinations and respective intermediate points, except to Adair, Table Grove, and Vermont, were unreasonable in the past to the extent that they exceeded the rates designated as prescribed in Appendix A." I. C. C. Docket No. 24,568, *Missouri Gravel Co. v. C. B. & Q.*

Finding the rates on sand and gravel from Hanover, Kans., to Pickrell, Cortland and Princeton, Neb., not unreasonable, unduly prejudicial or unjustly discriminatory, the commission has dismissed the complaint in I. C. C. Docket No. 25,558, *Washington County Sand and Gravel Co. v. U. P. et al.*

Reparation has been awarded on finding after further consideration affirming the finding in 191 I. C. C. 737, covering the rates on crude sand with 2 or 3 per cent. natural bituminous content from Big Clifty, Ky., to Ironton, O., and Milwaukee, Wis., in which these rates were found unreasonable. Four commissioners dissented in this opinion. I. C. C. Docket No. 24,936. O. A. Smith Agency, Inc., v. I. C. C. et al.

Reduced Rate Case.—With the three commissioners who heard the evidence presented dissenting the commission has denied any general reduction in freight rates. This investigation was instituted following the filing of a petition by the American Farm Bureau Federation; Farmers' Educational & Cooperative Union of America; National Coal Assn.; National Grange, Patrons of Husbandry; and the National Lumber Manufacturers' Assn. This petition sought a reduction in the freight rates on basic commodities. The commission published the following ten findings which were discussed at some length in the report. "1. That the existing general level of freight rates, excluding emergency surcharges which expire Sept. 30, 1933, is more than 20 per cent. below that of 1920 and more than 10 per cent. below that immediately following Reduced Rates, 1922, 68 I. C. C. 676. 2. That the freight rate level is not depressing the volume of traffic or business of the country as a whole and that general rate reductions would not stimulate the aggregate volume of traffic by railroad, except so far as they would tend

to recover traffic from competing forms of transportation. 3. That after allowance for the recent upturn in commodity prices the freight rate level is still relatively higher than the commodity price level. 4. That the value of commodities transported is one factor in determining reasonable rates, but prices alone are not controlling. 5. That the earnings of rail carriers have been greatly affected by loss of traffic to motor and water carriers and by reduced rates made to meet competition by such carriers. 6. That the net revenue of the rail carriers in 1932 was the lowest in many years, being only approximately half that of 1921, a depression year; and that, after making full allowance for the recent upturn in the volume of traffic, if rates in general were lowered as much as ten per cent. the net revenue in the near future would probably fall short of meeting fixed charges. 7. That general rate reductions by still further lowering the revenues of the rail carriers, would threaten the continuance of adequate railroad service and, by preventing maintenance and other work, would tend to increase unemployment. 8. That preservation of an adequate railroad transportation machine is more important to the country than lowered freight rates. 9. That there is not sufficient evidence upon which to determine the reasonableness of rates on particular commodities or descriptions of traffic. Rate revisions must be continued without abatement to meet new conditions. Rate peaks must be retained where justified and cut down where found unjust. 10. That existing freight rates and charges subject to the interstate commerce act, in the aggregate, in the country as a whole or in the several rate groups, or as applied to specific commodities or descriptions of traffic, are not shown to be unreasonable. Proceeding discontinued." Some further extracts from the report that are of general interest follow. By far the most serious diversion of traffic from rail carriers in recent years has been to trucks. As a result of improved highways movement by truck has greatly increased almost everywhere. The southwestern carriers have divided their traffic into three classes. That not subject to truck or water competition on either long or short hauls; second, that subject to truck or water competition for short distances; and third, that subject to competition for both long and short hauls. They found that 28 per cent. of the southwestern carriers' tonnage is subject to direct and keen truck competition. The rail carriers are not only affected by the loss of tonnage to trucks and water carriers but have been forced to reduce thousands of rates in an

effort to retain their existing tonnage or regain some of that already lost. The unrestricted and destructive competition between motor carriers, between water carriers, and of both with rail carriers, is not only having an unduly depressing effect upon the revenues of the rail carriers but is exerting a disorganizing influence upon business in general and tending to prevent the maintenance of a stable and non-discriminatory rate adjustment by the rail carriers. These conditions will undoubtedly exist so long as interstate motor and water carriers are exempt from requirements that their rates be published and maintained on a reasonably stable and non-discriminatory basis. After giving full consideration to the recent upturn in business, there is little probability that the volume of freight traffic in the next 12-month period will exceed that of 1931. In 1932 tax accruals amounted to over 10 per cent., and compensation of employees to nearly 57 per cent. of the total operating expenses and taxes.

No one has presented or can present a workable definition of basic commodities, nor has anyone shown how a list of such commodities could be selected without creating prejudice and preference as between different industries and disastrous results to some. If carriers cannot earn enough to pay the cost of service, plus a reasonable profit, all incentive for continuing the service is removed. The country is not ready to abandon its railroads. We believe that it is our duty to do that which presents the greatest promise of preserving in operation the efficient railroad mileage of the country. General reductions in rates would tend to defeat that end. The dissenting opinion written by Commissioner Aitchison and concurred in by Porter and Lee, recommended that rates which had not been reduced to 10 per cent. below the level found by the commission to be reasonable in 1922, be reduced to that level. I. C. C. Docket No. 26,000, in the matter of rates and charges, 1933.

New Complaints Filed

Dolomite.—The commission has suspended until March 1st, schedules published in supplements 64 and 66 to Pennsylvania tariff, I. C. C. 135, proposing to increase the rate on raw dolomite¹ from Bettsville, Gibsonburg, Maple Grove and Woodville, O. to Fairmount, W. Va. on the B. & O. and the Monongahela, R. R., from \$2.06 a gross ton to \$2.10 a net ton.—I. & S. Docket No. 3,894.

Sand.—New rates and reparation are sought in connection with the movement of core and moulding sand from Fox Point and Wickford Jet., R. I. and Elnora, N. Y. to New Brunswick, N. J. Violation of section 1 is alleged.—I. C. C. Docket No. 26,098, International Motor Co., New York, N. Y., v. D. & H. *et al.*

On a complaint of unreasonable

rates on molding sand from Ushers, Elnora and Selkirk, N. Y. to Bristol, Conn., complainant seeks new rates and reparation in I. C. C. Docket No. 26,123, The Sessions Foundry Co., Bristol, Conn. v. New Haven *et al.*

Recent I. C. C. Decisions

The same complaint and prayer covering movement of moulding sand from West Albany, N. Y. to Weir Branch, Mass. is being investigated in I. C. C. Docket No. 26,125, Glenwood Range Co., Taunton, Mass. v. New Haven *et al.*

Sand and Gravel.—New rate and reparation are sought on a charge of an unreasonable rate on sand and gravel from Machias, N. Y. to Bradford, Pa. in I. C. C. Docket No. 26,094, McHugh Bros., Springfield, O. v. Pennsylvania *et al.*

Before the Courts

Sand and Gravel.—A petition has been filed in the federal court of the eastern district of Missouri, northern division, at St. Louis, seeking an injunction against the enforcement of the Commission's order in Docket No. 17,789, Missouri Gravel Co. v. C. B. & Q. *et al.*, on rehearing, dated May 9, 1933. Complainant alleges that the commission is without authority to increase rates theretofore prescribed by it without finding that the prior rates were unreasonably low or otherwise unlawful, and that the petitioning company was not accorded a fair, just or legal hearing and was denied due process of law, and further that the increased rates will prevent it from obtaining business at the localities mentioned in the complaint at any and all times.

Rate-Committee Dockets

New England Freight Assn.

Fluxing Stone.—Shippers propose a reduction in the rate on fluxing stone from Rockland, Me. to Boston, Amesbury, Beverly, Mass., and grouped points from \$2.70 per net ton to \$2.01 per gross ton.—Docket No. 30,390.

Trunk Line Assn.

Crushed Stone.—Carriers propose a rate of 65 c. per net ton on crushed stone and related articles from S. Bethlehem and Feura Bush, N. Y., to Albany and West Albany, N. Y.—Docket No. 31,251.

Ground Limestone.—Carriers propose a rate on ground limestone, car-load minimum weight 60,000 lb., from Thomasville and Bittering, Pa. to Trenton, N. J. of \$2.00 per ton.—Docket No. 31,165 Sup. 1.

Gypsum Rock.—Shippers propose a rate on crushed gypsum rock from New York State producing points to Portland Point, N. Y. of \$1.70 per ton.—Docket No. M-3,239.

Sand.—Carriers propose a reduction in the rate on moulding sand¹ from Schenectady and group points to Albany, N. Y., from 76 c. to 70 c. per net ton.—Docket No. 31,202.

Central Freight Assn.

Crushed Stone.—Shippers propose the establishment of rates on crushed stone in open top cars from Erie, Pa. to destinations in Pennsylvania west of a line drawn from Sand Patch, Pa. on the B. & O. to Cresson, Pa. on the P. R. R., thence due north to the Pennsylvania-New York state line, on basis of the following mileage scale.—Docket No. 36,758.

Miles	Single	Joint
20	\$0.60	\$0.80
40	.70	.90
60	.80	1.00
80	.90	1.10
100	1.00	1.20
125	1.10	1.30
150	1.20	1.40
175	1.30	1.50
200	1.40	1.60

Shippers propose a reduction of 10 c. per ton in the rates on crushed stone from Black Rock, Buffalo and E. Buffalo, N. Y. to stations Farnham, N. Y. to Frewsburg, N. Y., except that to Dunkirk the proposed reduction is 3 c. per ton.—Docket No. 36,767.

Illinois Freight Assn.

Amesite.—Rates on amesite¹ from Joliet, Ill. to I. R. C. territory are proposed to be made on the basis of the following mileage scale.—Docket No. 7,455.

Miles	Single	Joint
25	\$0.96	\$1.16
40	1.07	1.27
60	1.19	1.39
75	1.30	1.50
100	1.42	1.64
200	1.99	2.19
300	2.57	2.77
325	2.68	2.88

Western Trunk Line Committee

Amesite.—Shippers have proposed a mileage scale to be used in making rates on amesite,¹ from Barton, Kan. to points in Kansas. Rates at points on the scale are shown below. The complete scale will be furnished on request.—Docket No. 1,873-R.

Miles	Single	Joint
10	\$0.70	\$0.90
50	1.05	1.25
100	1.30	1.50
200	1.80	2.00
500	2.85	2.85

Texas-Louisiana Tariff Bureau

Talc.—It is proposed to establish column 17½ rating in lieu of column 22½ on soapstone or talc, car-load minimum weight 60,000 lb., to apply between Texas points, and between Texas points and the Shreveport group.—Docket No. 8,765-TX.

¹ The car-load minimum weight will be 90 per cent. of the marked capacity of the car except that when the car is loaded to its full cubical or visible capacity, the actual weight will apply.

Foreign Developments

Sees Rust Danger in Crushed Gneiss Sand

Since the ordinary minerals in gneiss and granite are often accompanied by small quantities of pyrites, Dr. Heinrich Luftschitz, writing in *Zement*, Mar. 9 (22:136-8), urges caution in the use of crusher sand from these rocks as concrete aggregates, since the pyrites may reduce the concrete strength by reacting with the cement gel, and by swelling during its "rusting" reaction. The presence of pyrites can be perceived visually and by easy chemical analyses. Luftschitz proposes SO₂ tolerances of 0.6 per cent. for 1:10 concrete in the air and 0.1 per cent. for the same concrete in air and moisture; for 1:5 concrete, 1.2 per cent. in the air, 0.2 per cent. in air and moisture and 0.7 per cent. under water.

In an editorial note *Zement* points out that the article deals entirely with possibilities, as the magazine has no record of concrete failures due to the use of gneiss or granite-crusher sand.

Germans Argue Standard Classification of Lime

Numerous and often confusing terms for lime are current in Germany, referring variously to the raw or burned state, hydration, the presence or absence of magnesia, "fatness" or "leanness," the content of hydraulic factors, etc. The standard specifications are in progress of revision. A first draft (DIN E1060) was issued in August, 1931, and a revision in October last year. Meanwhile, Dr. Heinrich Luftschitz has published in *Tonindustrie-Zeitung* (Sept. 22 and 29, 1932; 56:958-60 and 984-6) a proposal of his own for a standard classification and designation of limes, which has called forth controversial articles by Fritz Eisemann, a collaborator on the official standards (*Tonindustrie-Zeitung* 56:1217-8, Dec. 8, and reply by Dr. Luftschitz 57:16-18, Jan. 5, 1933), and by Dr. Otto Friz (*Tonindustrie-Zeitung* 57:76-8, Jan. 23, and reply by Dr. Luftschitz 57:175-6, Feb. 20).

The proposed standards classify limes into "white" lime (hydraulic factors, calcined, not over 10 per cent., magnesia not over 5 per cent.), "dolomite" lime (hydraulic factors not over 10 per cent., magnesia over 5 per cent.), "water" lime, "cement" lime and "Roman" lime, the last three being hydraulic limes with more than 10 per cent. hydraulic factors and distinguished from one another in their capacity for slaking. Dr. Luftschitz groups the first two as "air" limes; the last three he groups as hydraulic limes and defines their content of hydraulic

factors as 10 to 20 per cent. for the "water" limes, 20 to 30 per cent. for the "cement" limes, and over 30 per cent. for the "Roman" limes. Other terms referring to the nature of the raw material, magnesia content, etc., are proposed.

The ensuing discussion illustrates the difficulty of pinning definite values on widely-current words in any case, and particularly when scientific evaluation of so many factors is still lacking. Eisemann points out the intention of the standard specifications to indicate quality as well as classification by restricting the content of extraneous matter (including insoluble silica) to 3 per cent. in "white" lime and 5 per cent. in dolomite lime. Luftschitz objects to a specification based on acid-insoluble as long as the whole question of the combination between lime and hydraulic factors and the effect of calcining temperatures is so little known.

Coarse Grains of Quartz Silica React in Burning

An investigation conducted by Dipl.-Ing. Bernhard Berkowitz and reported by Dr. Hans Kühl in *Tonindustrie-Zeitung* 57:297-8 and 321-3 (March 27 and April 3, 1933) sought to determine the behavior of quartz silica of varying fineness in ordinary alumina-bearing cement material. The material was an ordinary mixture of limestone and clay, with enough ground quartz sand added that the silica in the mix consisted three-fourths of clay silica and one-fourth of quartz silica. The fineness of the quartz varied from 0.015 to 1.07 mm. in the different specimens.

It was found that in this normal cement mix even comparatively coarse grains of sand react vigorously and are completely dissolved, although it is known that in a raw mix containing no alumina quartz silica reacts only when it is very finely ground. The reaction between the coarse grains and the other components sets in between 1100 and 1200 deg., probably because of the formation of a eutectic corresponding to quintuple point 2 in Rankin's diagram.

At about 1300 deg. the presence of coarse quartz silica leads to marked

crumbling, attributed to the formation of dicalcium silicate. In the temperatures between 1300 and 1350 deg. a lively reaction sets in again between the quartz silica and the other components of the system, which is attributed to the occurrence of a eutectic corresponding to quintuple point 6 in the Rankin diagram.

The fact that even coarse quartz silica reacts in the burning of standard cement mix does not take away the need for fine grinding, for the aim of the burning process is not merely to drive the silica to react, but to bring about the formation of as much tricalcium silicate as possible.

German Stone Won by Letting Face Cave In

A blast at the huge Rüdersdorf limestone quarry in Germany is a spectacular event, for the mass of stone to be brought down is undercut with galleries 26 ft. high, leaving the mass above supported only by massive columns; then, when these pillars are blasted away, the whole 100-ft. face falls in. This is a simple and very efficient method of winning rock, though practical only where there is a high face and where the structure of the rock is neither so compact as to resist caving in nor so loose as to fall prematurely. About 40,000 cu.m. is brought down at a time, and in normal times there are ten blasts a year, requiring 3 tons of chloratite all together.

According to Pliny, the Romans used this quarrying method in Spain, though the pillars were not blasted but were cut away by slaves who had to run for their lives when the rock mass began to crack.—*Tonindustrie-Zeitung*, 57:417-8, May 4, 1933.

Jaw Crusher of Record Size Built in Germany

What is said to be the most massive jaw crusher ever built is being completed in the shops of the Krupp Grusonwerk, Magdeburg. It has an overall weight of 235 metric tons, and the heaviest single part, the moving breaker plate, weighs about 40 tons. The crusher is approximately 17 ft. high, 23 ft. long and 20 ft. wide. It can take a block of stone or ore up to 10 tons in size and in one pass break it down to football size and smaller. It can handle the load of a 20-ton car in 1½ to 2 minutes, and in continuous operation crush 500 to 800 metric tons a day.—*Steinindustrie* 28:110, June 22, 1933.

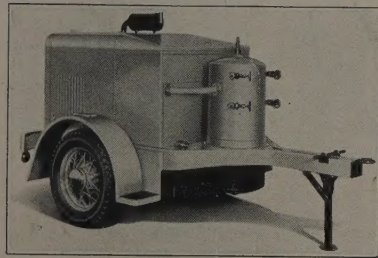
As a service to its readers PIT AND QUARRY is prepared to supply, at the actual cost of labor and materials, an English translation of any paper abstracted in this magazine. In the case of illustrated papers or articles photostatic reproductions of the illustrations will accompany the translations. Prices will be quoted on request.

New Machinery and Supplies

Amplex Mfg. Co. Develops New Portable Compressor

The Amplex Mfg. Co. Division of the Chrysler Motors Corp., Detroit, Mich., has developed a new portable compressor with many unique features. The unit consists of a special 4-cyl. air compressor, belt driven by a Chrysler 4-cyl. industrial engine, with two radiators, air tank and accessories mounted on a rigid frame and carried on two rubber-tired wheels. Other features of this unit are its high volumetric efficiency of 88 per cent. at the normal operating speed of 1200 r.p.m., the reduced compression ratio which lowers the temperature of the delivered air, and the governor which operates the compressor at speeds in proportion to the demand for air.

A belt drive is used from the engine to eliminate all shock and the compressor is made up largely of parts



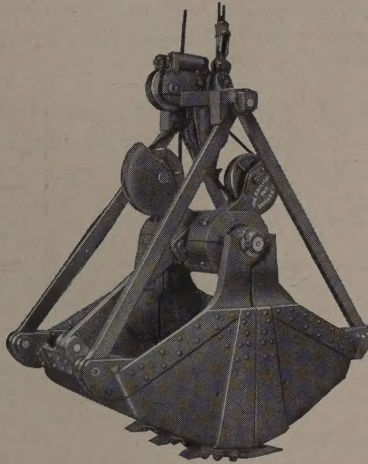
New portable air compressor.

common to the engine, making for interchangeability of parts. These units are made with the same high productive machine and tool equipment of the automotive divisions of the company. Both the engine and the compressor have four cylinders cast in block integral with the crankcase and with a displacement of 196 cu. in. Forced feed lubrication is supplied by a gear-type oil pump and aluminum pistons of slotted skirt design are used. The compressor governor is Chrysler designed and is pressure controlled, with a throttle on the intake manifold.

New Kiesler Clam-shell Designed for Digging

The Jos. F. Kiesler Co., Chicago, Ill., announces the new Kiesler Type N digging clamshell bucket which is especially recommended for digging blue clay and hard pan and for handling large sizes of crushed stone or gravel. Features of this bucket are internal Alemite lubrication, cutting edges of alloy heat-treated steel, alloy heat-treated chisel-pointed steel teeth attached to the bucket with special non-turning countersunk bolts, new type non-wabbling one-piece solid cast-

steel head beam, and simple reeving of cable which is claimed to give full closing power and longer life. The shells are also of improved design and are made of one-piece flange steel plate with no obstruction on the outside.

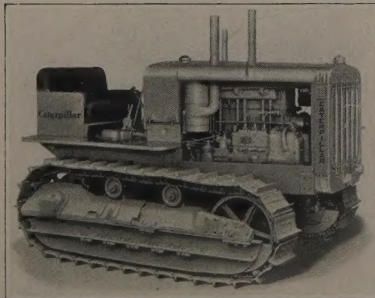


Kiesler Type N digging bucket.

All sheaves and corner connection arms are fitted with renewable heat-treated alloy steel bushings. Other features are the improved double lever arms attached to the top of both shells and the fact that there are no operating parts inside the bucket. These buckets are made in 11 sizes in capacities ranging from 1/10 to 2 cu.yd.

Caterpillar Brings Out 3-Cyl. Diesel Tractor

The Caterpillar Tractor Co., Peoria, Ill., recently announced the new Caterpillar Diesel 35, the third of a series of Diesel tractors and power units developed by this company. This unit is said by the company to be new in name only as it merely combines a Diesel engine with a chassis which has



Caterpillar Diesel 35 tractor.

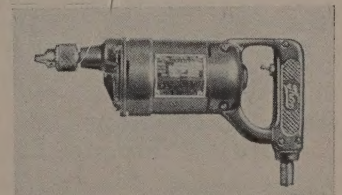
been proved over a period of many years. Even the engine is not new as it differs only in horsepower and number of cylinders from two larger en-

gines which have been in the field for many months. The Diesel 35 engine has the same bore and stroke, bearings, cylinder liners, connecting rods, pistons, wrist pins, etc., that are used on the Caterpillar Diesel 75 and 50 tractors. These have 6 and 4 cylinders, respectively, while the Diesel 35 has only 3 cylinders, but all are manufactured on the same machines and employ the same parts.

This tractor has full force-feed lubrication, a statically and dynamically-balanced crankshaft supported by four large main bearings, and has four forward speeds ranging from 1.7 to 4.6 miles per hr. The 13,900 lb. of weight are supported on 2,000 sq. in. of traction. A 53-in. tread center to center of the track shoes is standard but wide-gauge models with a 74-in. tread and track shoes of various widths are available. An auxiliary gasoline engine cranks the Diesel engine through a Bendix drive. The 3-cyl. engine used in this tractor is also available as a self-contained power unit.

Independent Presents Light Electric Drill

The Independent Pneumatic Tool Co., Chicago, Ill., recently brought out a new Thor 1/4-in. light-duty electric drill. The drill motor is equipped with ball bearings on both ends of the



Thor light-duty electric drill.

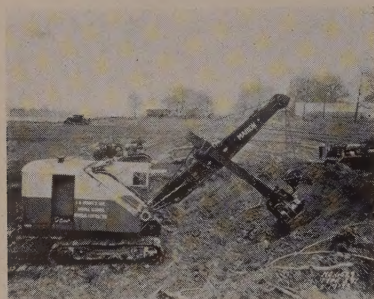
armature and each coil is hand wound and formed. The commutator is a separate unit, built up on a brass sleeve that expands and contracts evenly with the copper segments. A dust-proof toggle switch is placed just inside the handle. The tool weighs 5 lb. and runs at a speed of 2200 r.p.m.

Marion Has New Line of Clutch-Type Excavators

The Marion Steam Shovel Co., Marion, O., has added to its line a complete series of fully-convertible clutch-type excavators. In these units it was sought to combine mobility, versatility, long life and strength. They can readily be converted from shovel to dragline, crane, clamshell, or trench shovel or vice versa.

These excavators have a primary power unit, either gasoline, Diesel, or

a single electric motor, connected through a master clutch and speed reducing mechanism directly to the main machinery. The various functions of hoisting, traveling, swinging, crowding and booming are independently controlled through friction clutches. The crawlers are chain driven and, in addition to the two drive sprockets for each crawler, an intermediate



Marion clutch-type shovel.

roller is provided for each shoe. The main lower frame is a single steel casting and the swing gear is a one-piece steel casting bolted and dowelled to the top of the frame.

A type of external contracting band clutch is used which is said to slip without overheating, take hold without grabbing, and grip securely when entirely engaged. The dipper is of oversized capacity, the shovel boom is all-steel, and the dipper handle is of the outside type, made of a combination of hard wood and steel. The boom for dragline, clamshell or crane is of latticed angle construction with removable middle sections. Anti-friction bearings are used wherever possible.

Sauerman Develops New "Utility" Scraper Line

An announcement from Sauerman Bros., Inc., 434 S. Clinton St., Chicago, tells of the production of a new line of low-priced Crescent drag scrapers. The new "Utility" line of Crescent drag scrapers is said to be particularly suitable for use with the 1933 types of portable and semi-portable screening and crushing plants and for any light excavating that calls for moving materials in quantities of



Sauerman Utility scraper at work in pit.

from 10 to 100 cu. yd. any distance up to 500 ft. For larger capacities, longer hauls, and unusually tough digging conditions, the manufacturer states that it is preferable to use the standard Crescent drag scrapers which are of heavier construction.

There are five models of these "Utility" Crescent scrapers with buckets ranging in capacity from 9 to 40 cu.ft., and operating spans ranging from 100 to 500 ft. The complete unit includes a specially-designed 2-speed power unit equipped with either a gasoline or electric motor or with a belt pulley.

High Efficiency Claimed for Healthguard Mask

The Chicago Eye Shield Co., Chicago, Ill., has developed a new "Healthguard Mask," known as Style No. 601. This mask, which is rated over 99 per cent. efficient, was designed primarily for sand-blasting and other occupations where harmful dusts are encountered. The mask consists of a soft moulded rubber facepiece designed to adapt itself to any facial contour and when in position the interior is entirely sealed against outside air. A moulded rubber head harness, fitted with detachable and adjustable buckles holds the mask in position.

A moulded rubber tube attached to the side of the facepiece permits free movement of the head and connects



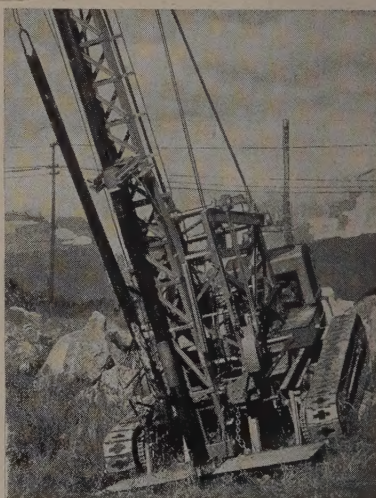
The new Cesco Health-guard mask with filter at belt. At right is hood worn over head and shoulders after mask is in position.

with the air filter which is attached to an adjustable belt. A quick-acting coupling connects the filter to the air supply. Air under pressure enters the filter where a cartridge removes foreign particles and odors. The volume of air is regulated by an adjustable control valve and an automatic relief

valve eliminates excessive pressure. Air entering the facepiece is broken up by a baffle and exhaled air is released by means of a positive exhaust valve. When in operation the facepiece is completely covered by an outer hood with large lenses and a perforated metal screen.

New All-Steel Drill Uses Chain Drives Only

The Keystone Driller Co., Beaver Falls, Pa., recently put on the market



Keystone drilling machine.

a new well drill, No. 71, which is said to be the first and only all-steel full-crawler-mounted percussion drill ever made for drilling holes of 6-in. and smaller diameter. This machine also uses chain drives throughout and has dual-spring shock absorbers for wire drilling. Although the machine can be used for larger holes maximum economy is obtained in drilling 6-in. holes. It will drill to a depth of 900 ft. and is especially suited to drilling in limestone and sandstone. All high-speed parts run in large ball and roller bearings. Roller chains eliminate slippage and reduce bearing loads and also contribute toward the compactness of the machine.

Iowa Mfg. Co. Appoints Many New Distributors

The Iowa Mfg. Co., Cedar Rapids, Ia., recently appointed the following new distributors: J. C. Corrigan Co., Boston, Mass.; J. Shuman Hower, Utica, N. Y.; Charles S. Porter Supply Co., Huntington, W. Va.; Interstate Machinery Co., Omaha, Nebr.; Bublitz Machinery Co., Kansas City, Mo.; Henry D. Petter Supply Co., Paducah, Ky.; Carolina Contractors Equipment & Supply Co., Columbia, S. C.; Contractors Service, Inc., Charlotte, N. C.